DXP

Digital Communications System

General System Description

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Comdial's Quality Management System Is Certified To The ISO 9001 Standard.

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1 Introducing The DXP

1.1 Using This Publication

What this book does

This DXP General Description provides an overview of the system and its features. The system's general specifications are detailed in full in Section 5, Knowing The General Specifications. Section 6, Understanding The Features, details all of the available features.

Where to find what you need

The General Description contains six sections. Use the following list as a guide to finding what you need in this book.

- **Section One*, Introducing The DXP,*** *gives you a general overview of the system and its capabilities.*
- ***Section Two, Understanding The Telephone Features****, lists the telephone models that function on the DXP. This chapter also lists the major features of the telephones, and it gives you diagrams and dimensions of each telephone model.*
- ***Section Three, Previewing The Hardware***, details all of the hardware for the DXP. Use this chapter to find definitions of the printed-wire-boards. Along with general definitions, section three gives the product code numbers and the installation locations for each board.
- **Section Four*, Connecting The System***, describes some basic installation instructions. You will find information on line and station connections in section four.
- **Section Five*, Knowing The Specifications***, lists all of the product codes and specifications for the DXP.
- **Section Six*, Understanding The Features***, defines all of the system's features.

1.2 Understanding The DXP

Station and line capacity

The DXP system is a 224–port, two-cabinet, digital communications system consisting of a main cabinet and an expansion cabinet. With analog, loop-start, DID, or multipurpose line boards, the maximum configuration is 32 lines and 192 stations, or 120 lines and 16 stations. However, by using the maximum of four 24-channel T1 boards, you can increase the number of stations that the system will support to 48 without reducing the maximum line capacity of 120 lines. This is because the T1 boards can provide maximum system line support while occupying fewer board slots than other line board types thus freeing board slots for station board use. Then, the system can use these free board slots for additional station boards, thus increasing the quantity of stations available when the system is providing maximum line capacity.

How the system works

The Comdial DXP digital communications system provides cost-effective voice and data communications using the latest PCM-TDM (pulse code modulated/time division multiplexing) digital switching technology. The DXP switching architecture provides a non-blocking switching array that gives all ports simultaneous access through the system. The digital technology allows simultaneous voice and data transmission using 2B+D signaling (CCITT specification for basic access data transfer rate for ISDN on a single twisted pair) when data terminals become available. The design is a fully modular, ISDN (integrated services digital communications network) system with 224 usable time slots and the flexibility for upgrade and expansion as needed. The DXP digital communications system supports the current Comdial line of DigiTech, Impact, and ExecuTech telephones.

2 Describing The Telephone Features

2.1 Using The Comdial Telephones

The DXP system supports many of Comdial's proprietary telephones as well as industry-standard telephones. The following list details the various telephone models.

- **DigiTech Telephones**
  - » 7700S — LCD Speakerphone
  - » 7701X — Multiline Telephone
  - » 7714X — Multiline Telephone
  - » 7714S — Multiline Speakerphone
  - » DD32X — 32-Button DSS/BLF

- ***Impact* Telephones**
  - » 8024S — 24 Line LCD Speakerphone
  - » 8124S — 24 Line Speakerphone
  - » 8012S — 12 Line LCD Speakerphone
  - » 8112S — 12 Line Speakerphone
  - » 8112N — Multiline Proprietary Telephone
  - » IB64X — DSS/BLF Console
  - » 8101N — Single line Proprietary Telephone

- **ExecuTech Telephones**
  - » 6620E — 23-Line Monitor Telephone
  - » 6620T — 23-Line Speakerphone
  - » 6614E — 22-Line Monitor Telephone
  - » 6600E — 17-Line LCD Speakerphone
  - » 6700S — 12-Line LCD Speakerphone
  - » 6701X — Single Line Proprietary Telephone
  - » 6706X — 6-Line Monitor Telephone
  - 6714S — 14-Line Speakerphone
  - 6714X — 14-Line Monitor Telephone
  - 6614T — 22-Line Speakerphone
  - DB70 — 70-Button DSS/BLF
  - DB32S — 32-Button DSS/BLF
  - EX32X — 32-Button DSS/BLF

2.2 Understanding The Telephone Features

The DXP supports the following telephone features on both analog and digital proprietary telephones. Some of these features are system-wide and others are specific to individual stations.

Alphanumeric Display

- Displays time, day and date
- Keeps you apprised of the status of your telephone
- Provides programming prompts

Auxiliary Jack (used only with *Impact* and DigiTech LCD speakerphone)

- Allows you to use your telephone privately and handsfree with headset
- Allows you to plug in a tape recorder
- Allows you to plug in a loud ringer
- Helps improve operation of high-volume business applications by adding a paging speaker

Button Query

- **Allows you to see the function of a programmed button on your LCD screen**

Hold Button

- Places a line on hold
- Stores pauses in number sequences while programming
- Allows you to scroll through multiple held calls on display

Interactive Buttons

- Provide quick and easy access to system and call processing features
- Provide straightforward button programming without dialing codes (the interactive buttons themselves, however, are not programmable)

Intercom Button

- Selects an intercom line
- Initiates many of the features of the telephone

Message Waiting Light

- Tells you that there is a message for you

Mute Button

- Keeps the person on the line or speakerphone from hearing your conversation

Programmable Buttons

- Allow you to program your telephone for automatic dialing functions
- Allow you to program your telephone for Direct Station Selection (DSS)
- Show which lines and intercoms are either in use or on hold
- Allow you to store frequently used feature codes at unused buttons

Ringer Volume Control
— Lets you vary ringer volume

Shift Button
— Allows you to program and access preprogrammed feature codes or secondary speed dial numbers (each programmable button can accommodate two feature codes or speed dial numbers)

Speaker Button
— Turns your speaker on or off
— Disconnects a call when your handset is on-hook
— Ends or cancels programming

Status Lights
— Shows status of line when next to line button
— Shows status of station when next to DSS button
— Shows status of feature when next to programmable button

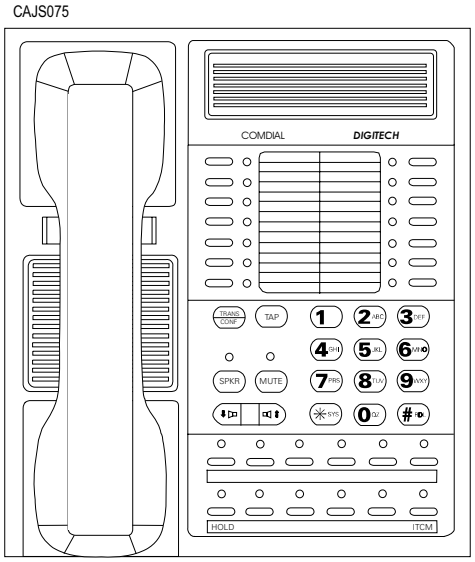
TAP Button
— Recalls dial tone, or activates host system features (must be programmed for either feature)
— Retrieves held calls (last call held is first call retrieved)

Transfer/Conference Button
— Transfers calls
— Sets up conference calls

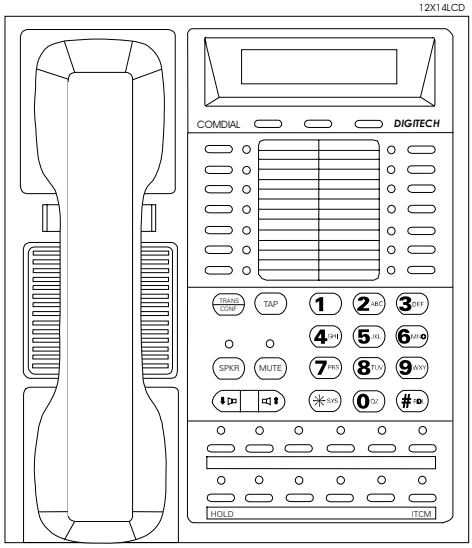
Volume Control
— Regulates the volume of the speaker and the handset

2.3 Using DigiTech Telephones

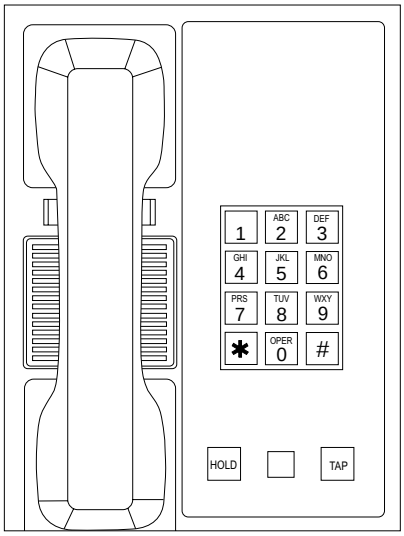
The DXP accepts all of the currently produced DigiTech telephones.



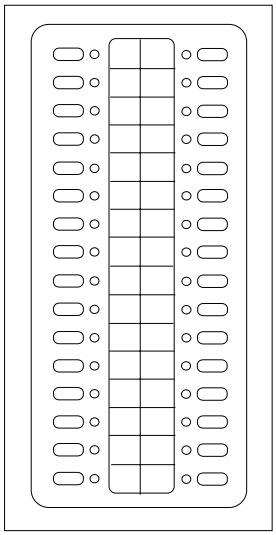
7714X, 7714S



7700S

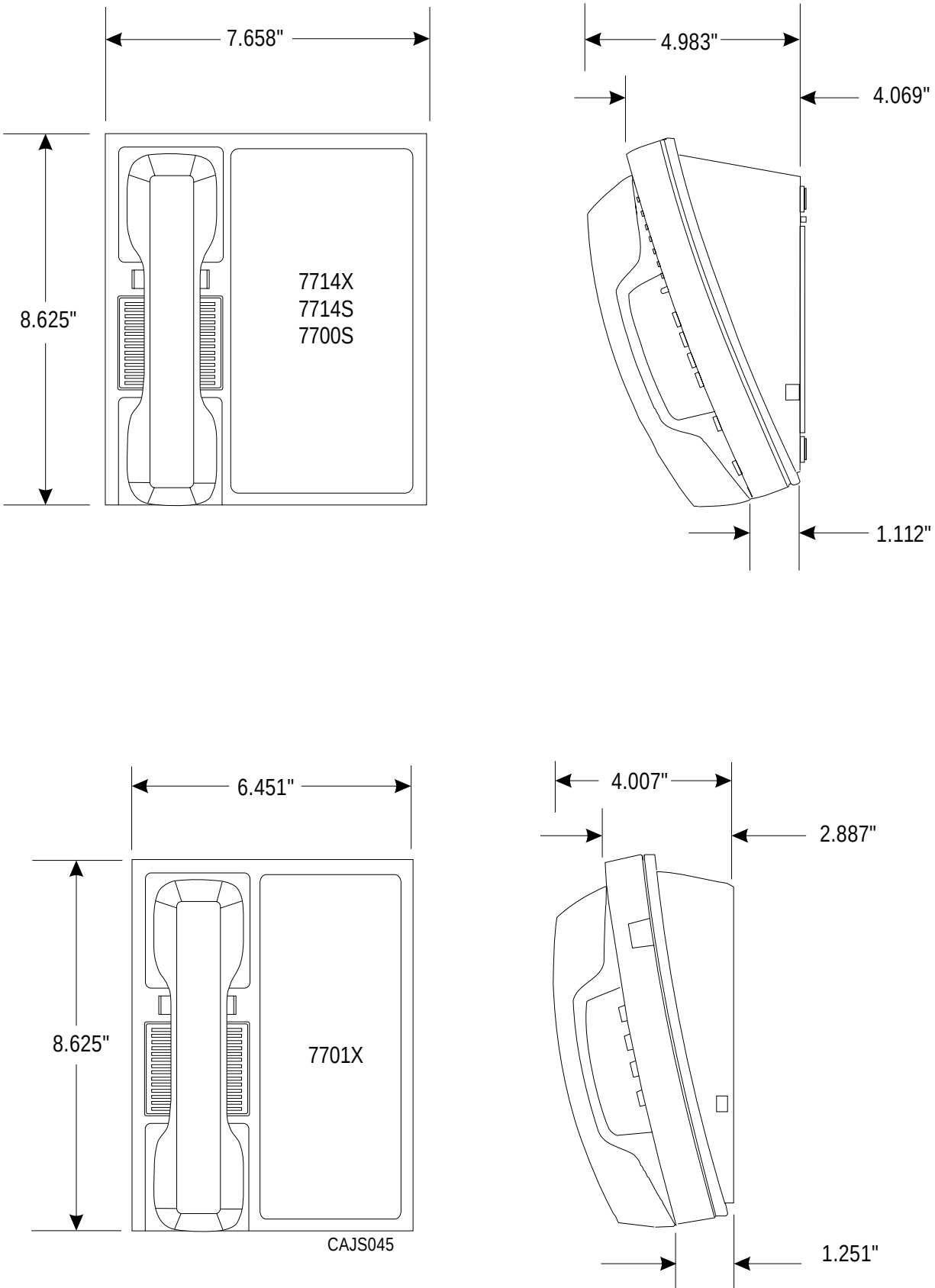


7701X



DD32X

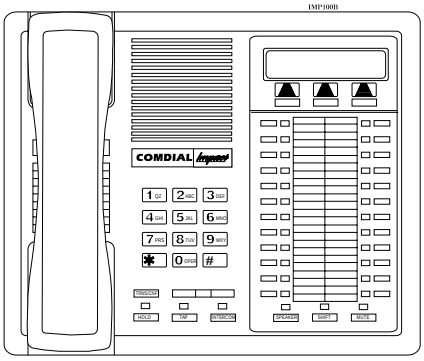
Detailing The DigiTech Station Configurations



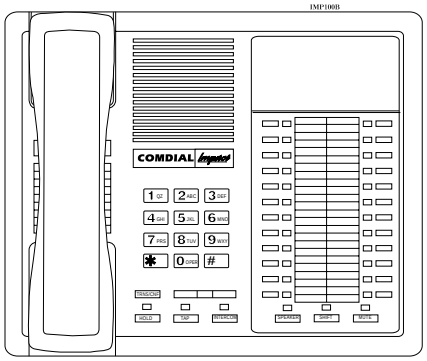
Illustrating DigiTech Station Outline Dimensions

2.4 Using Impact Telephones

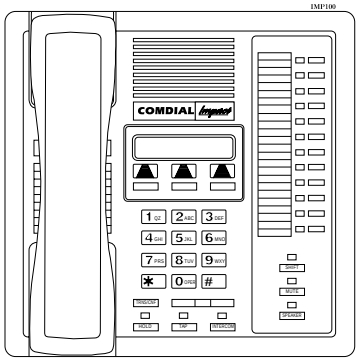
The DXP accepts all of the currently produced *Impact* telephones.



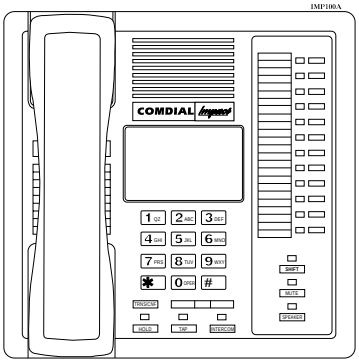
8024S



8124S

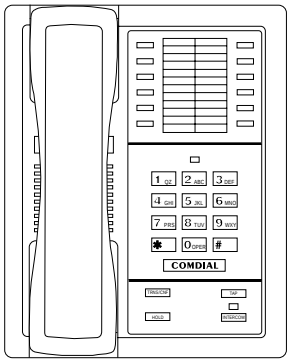


8012S

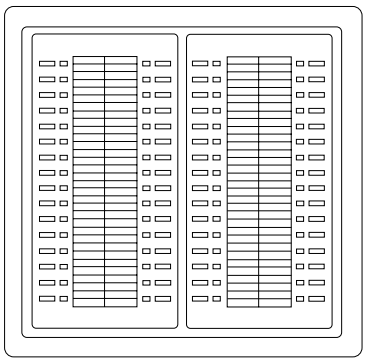


8112S

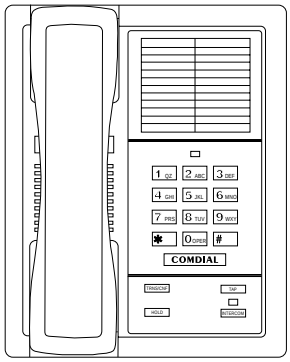
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8112N

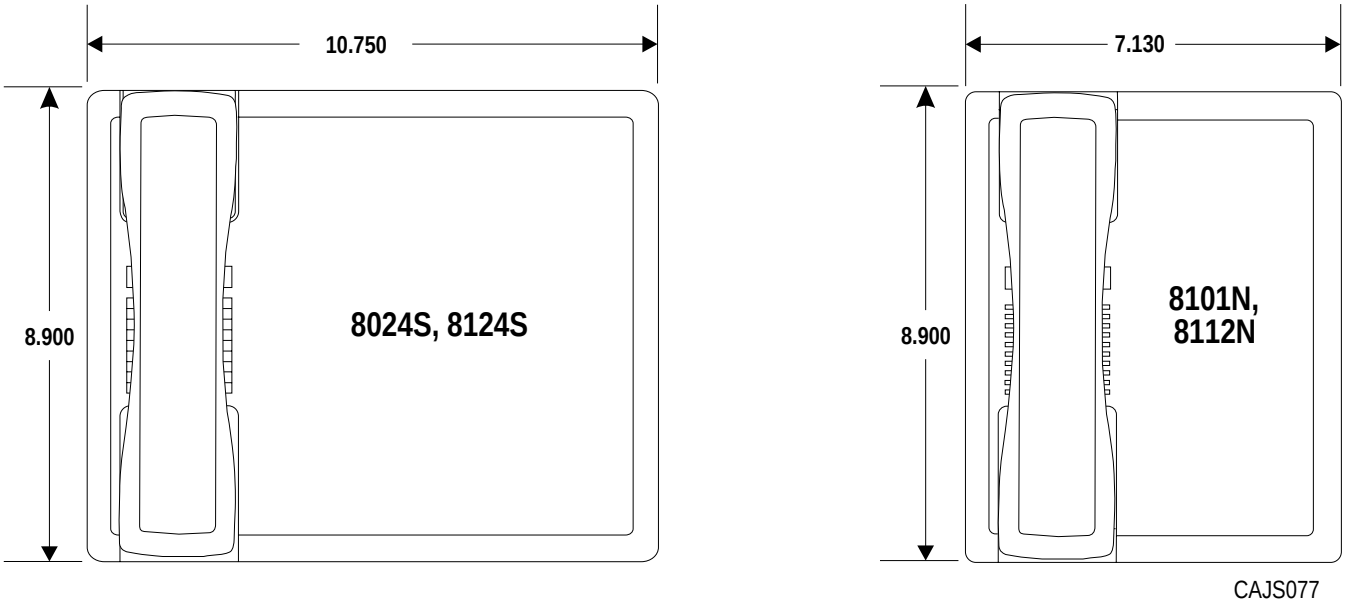


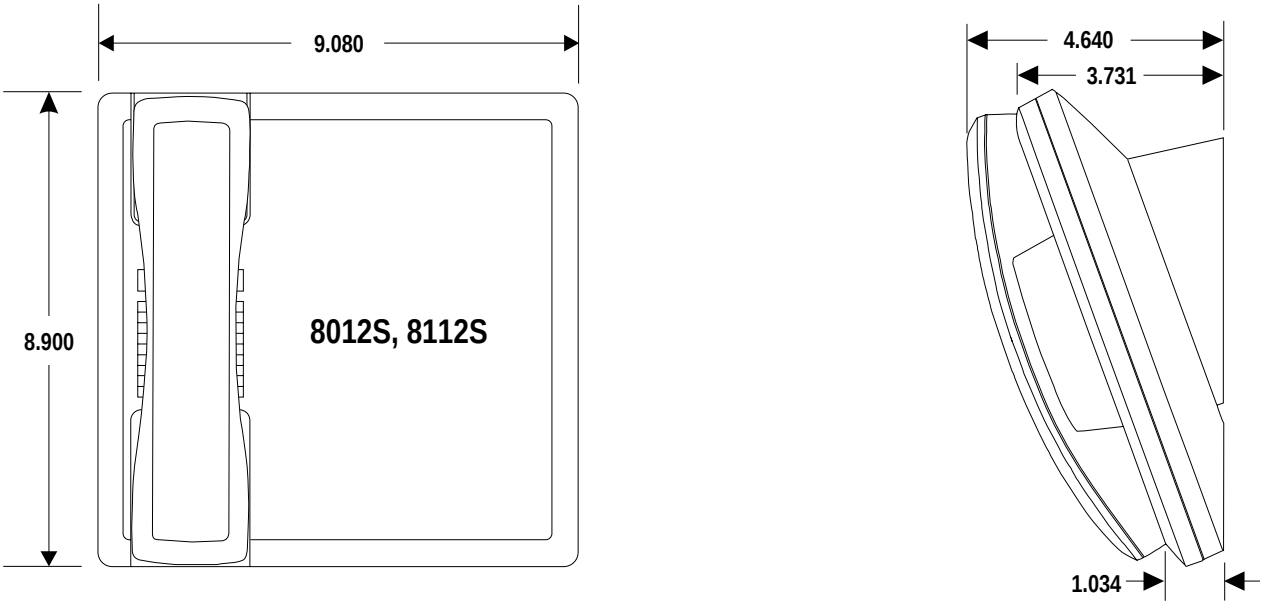
IB64X



8101N

Detailing The Impact Station Configurations

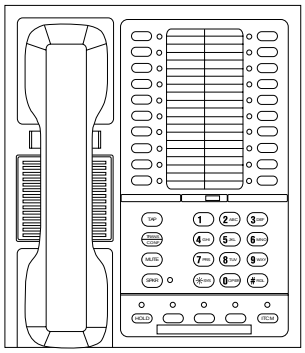




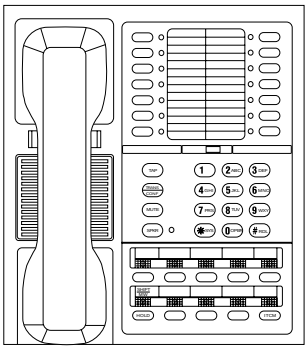
Illustrating The Impact Station Outline Dimensions

2.5 Using ExecuTech Telephones

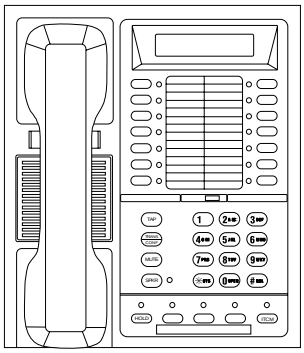
The DXP accepts all of the currently produced ExecuTech telephones.



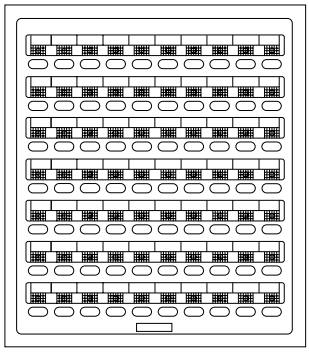
6620T
6620E



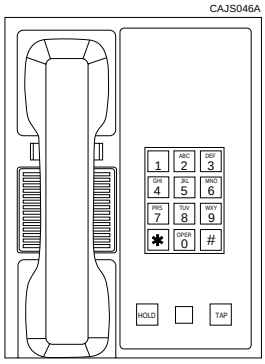
6614T
6614E



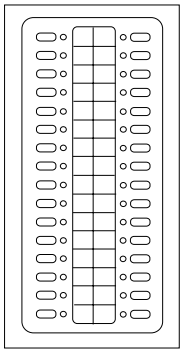
6600E



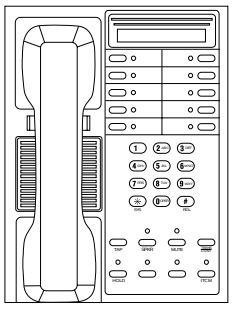
DB70



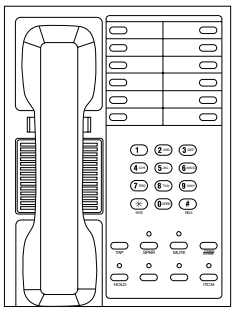
6701X



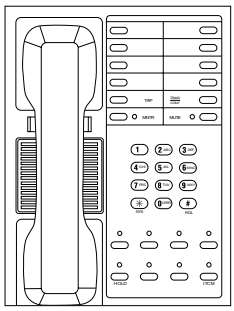
DB32X
EB32X



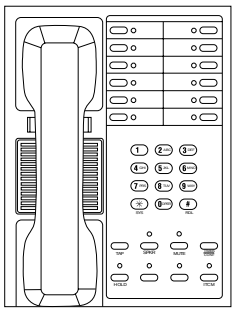
6700S



6702X

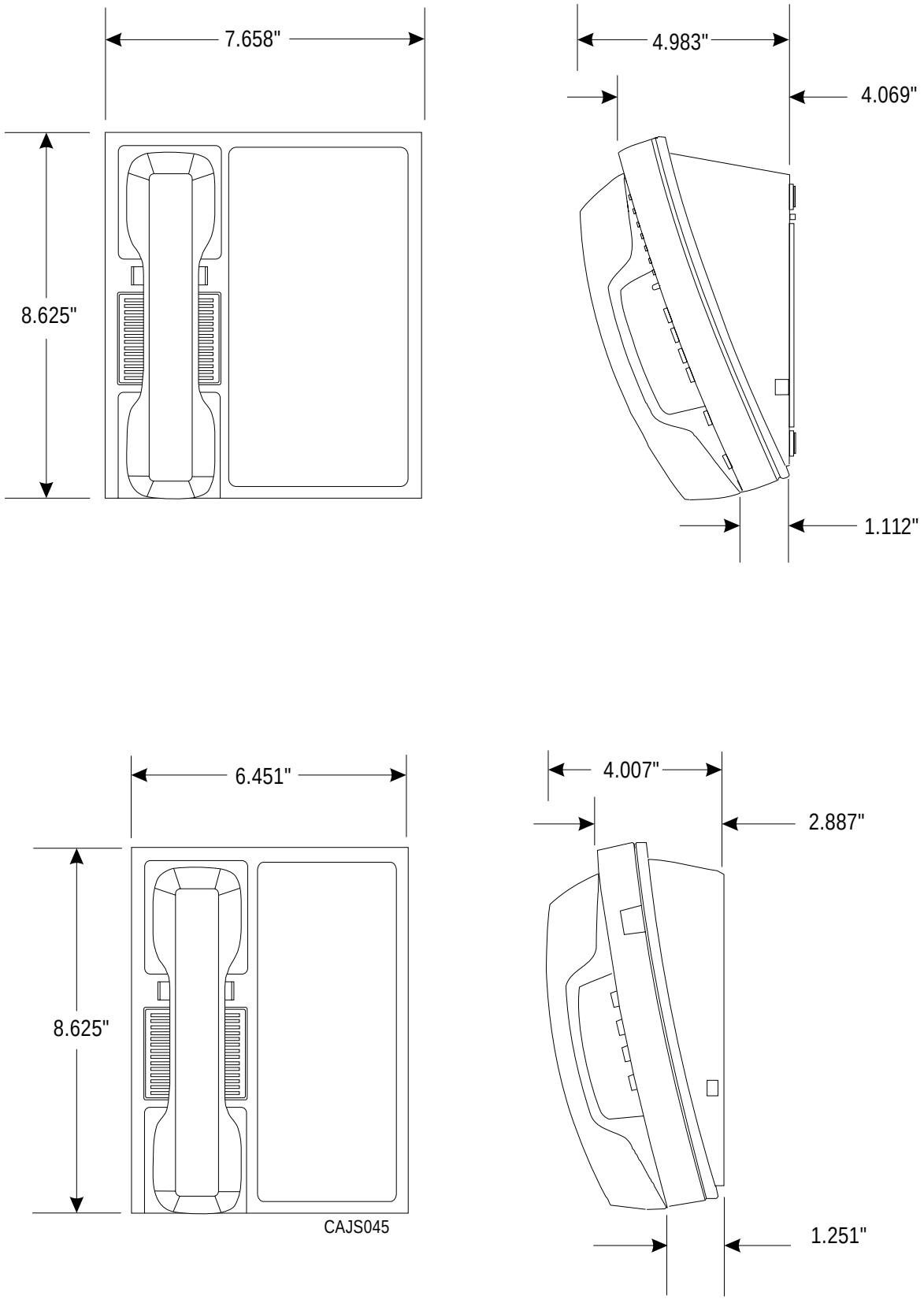


6706X



6714S

Detailing The ExecuTech Station Configurations



Illustrating The ExecuTech Station Outline Dimensions

3 Reviewing The Hardware

3.1 Understanding The Printed-Wire Boards

The basic system consists of a main cabinet, which accepts 12 printed-wire boards and an expansion cabinets that accepts eight printed-wire boards.

Auxiliary Board:

— A utility board that provides interface for a maximum of four special-purpose circuit cards. Actual make-up requirements depend upon system configuration. The DXP system accepts two auxiliary boards installed in the first two universal board slots.

Central Processing Unit (CPU) Board:

— Provides central processing and control for the system and other miscellaneous functions. The CPU board has the time switch and conference circuitry and two serial data ports, which have been dedicated for PC-based programming and a remote maintenance modem. The CPU board includes four dry-contact relays for external control functions.

Conference Board:

— Provide additional conference capability. Each board provides 5 additional 3-way conferences.

Interface Boards:

— Ties the main cabinet to the expansion cabinet. Both the main and expansion cabinet has an interface board. Interface boards are included with the expansion cabinet packages.

RAM Card and Software Card:

— Provides the memory storage and operating system control. The cards mount directly onto the CPU board.

Services Board:

— Provides an interface for music-on-hold and background music inputs; it also provides an output to an external paging amplifier.

3.2 Defining The Line Boards

The DXP accepts several different types of lines. In order to use these various lines, you must install the correct line board. The following list details all of the current DXP line boards.

Direct Inward Dialing Line Board:

— Direct Inward Lines (DID) are incoming only and are employed to reduce the number of channels between the DXP and the Central Office (CO). DID lines allow incoming CO calls to reach internal intercom extensions without going through the attendant station. DID operation requires a group of published directory numbers provided by the CO. The number of DID lines is limited only by the number of installed DID boards. The DID translation tables have limits that may affect DID capacities.

Loop-Start Line Board:

— The loop-start line board provides system interface for loop start lines. Loop start lines are the most common CO line type (loop-start lines do not usually offer disconnect supervision)

Multi–Purpose Line Board:

— The multipurpose line board provides system interface for ground start lines, loop start lines, and E & M Tie lines; these are typically the three line types that the central office (CO) makes available for connection. The multipurpose line board is programmable for each line type. You can have a maximum of two Tie lines on each multipurpose line board.

T1 Line Board:

— The T1 board provides 8, 16, or 24 channels of voice transmissions over a single four wire cable using multiplexing techniques. The system accepts a maximum of four T1 boards.

3.3 Defining The Station Boards

The DXP accepts digital, analog, and industry standard telephones. In order to use these different types of stations, you must install the correct station board. The following list explains each station board.

Analog Station Board

— The analog station board provides support for Comdial's proprietary analog telephones (such as the various ExecuTech models). Each board supports either 8 or 16 stations. A precharge port is provided for board removal or insertion without system power-down.

Digital Station Board

— The digital station board provides support for Comdial's proprietary digital telephones (such as the Impact and DigiTech). Each board supports either 8 or 16 stations. A precharge port is provided for board removal or insertion without system power-down.

Industry Standard Telephone Board

— The industry-standard station board provides support for industry-standard telephones. Each board supports either 8 or 16 stations. A precharge port is provided for board removal or insertion without system power-down.

3.4 Defining The Option Circuit Cards

The auxiliary boards accept the installation of smaller circuit cards.

Synchronization Card

— Adjusts the T1 transmit frequency to match the frequency from the CO. The synchronization card mounts onto the Services board only.

Communications Card:

— The optional communications card provides extra serial ports for the DXP. The communications card contains four serial communication ports You can install two communications cards onto the lower two slots of the auxiliary board. The system supports a maximum of 18 serial data ports.

DTMF Tone Card

— The DTMF Tone card expands the system's industry-standard dialing capability. The system has two IST DTMF receivers located on the CPU board while each DTMF card provides four additional DTMF receivers.

3.5 Locating The Boards

Main Cabinet

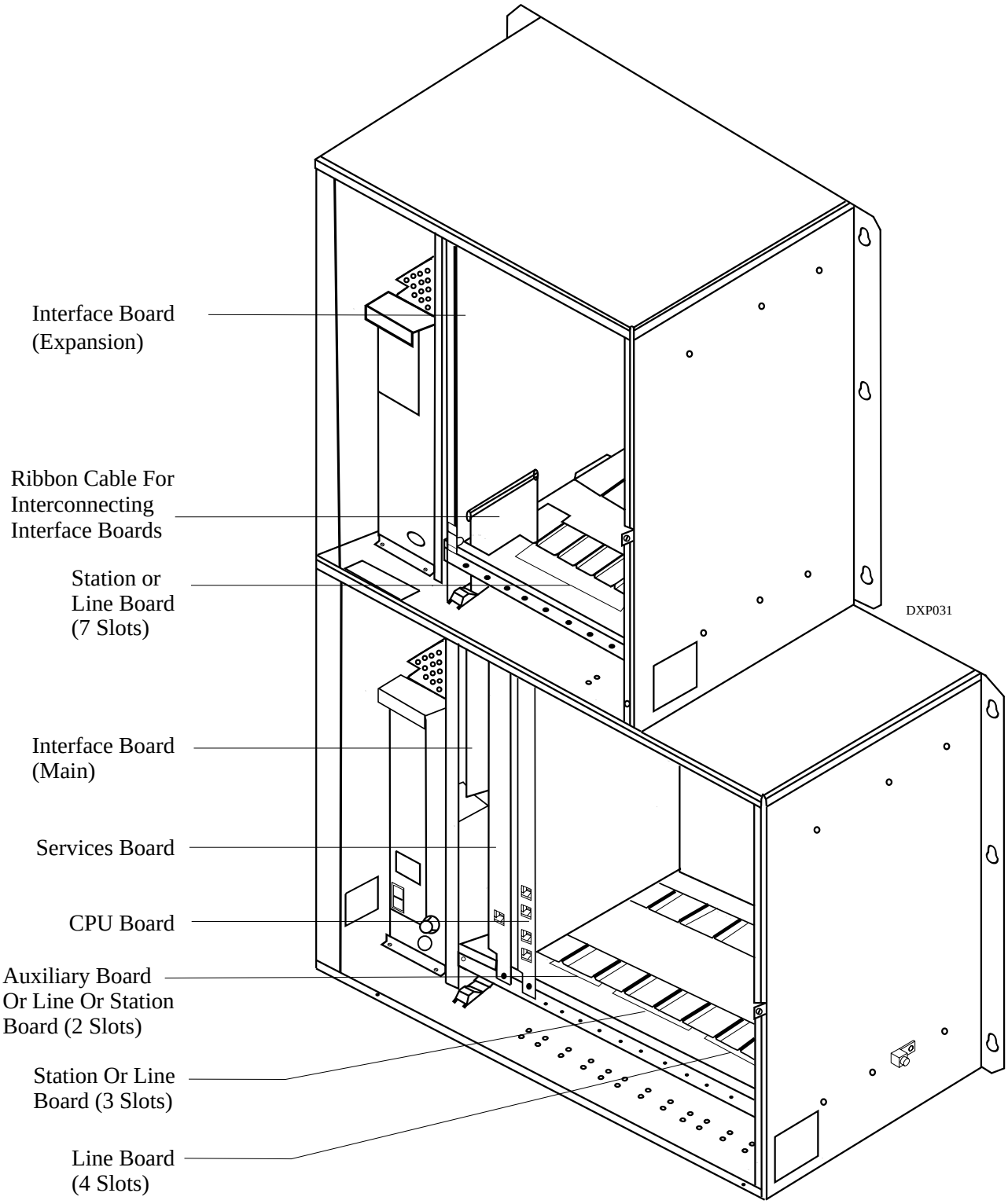
☐ The 12-board capacity of the main cabinet breaks down as follows from left to right:

1 – interface board slot
1 – services board slot
1 – CPU board slot
2 – auxiliary/universal slot (for auxiliary boards, station boards, conference boards, or line boards)
3 – universal slots (for station, conference, or line boards)
4 – line board slots

Expansion Cabinet

☐ The 8-board capacity of the upper expansion cabinet breaks down as follows:

1 – interface board slot
7 – universal slots (for station, conference, or line boards)

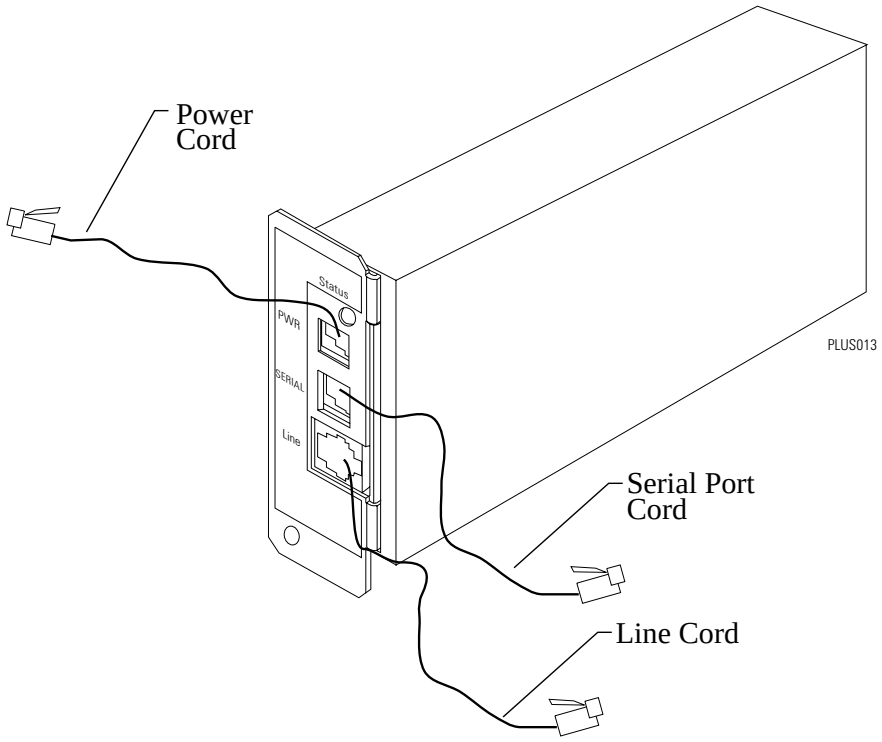


Locating The DXP Circuit Boards

3.6 Using The Modem

The modem is a general-purpose *Hayes™ compatible, 300, 1200, and 2400 automatic baud detect serial modem. The CPU board defaults serial data port RS232/2 for modem use and also provides a power port for the modem. If you connect the modem to a serial data port on one of the communications cards, you will have to program the system for modem operation on that port.

** Hayes is a registered trademark of Hayes Microcomputer Products.*

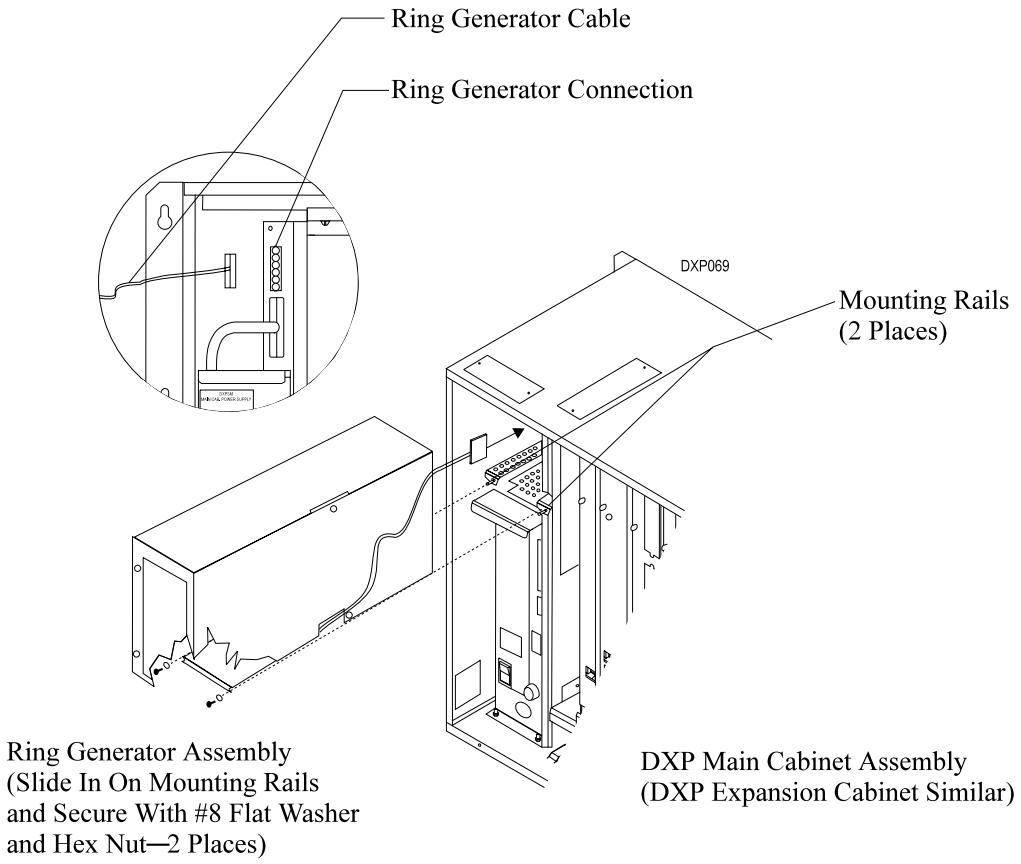


Illustrating The Modem

3.7 Using The Ring Generator

The DXP digital communications system supports the use of industry-standard telephones (IST). To use ISTs, the system requires a ring generator assembly to supply ringing voltage and message waiting voltage to the industry-standard telephones.

Regardless of the number of installed industry-standard telephones, you will need to install one ring generator assembly in each common equipment cabinet that has IST telephones connected.



Installing The Ring Generator

3.8 Understanding The Board Configuration

Line Port Location

The line numbers on every board ascend from the bottom line jack (lines 1 and 2) to the top line jack (lines 7 and 8).

The line ports for both the main and expansion cabinet ascend from the right-most slot to the left-most slot. This means that in the main cabinet, line ports 1–8 are in the rightmost board slot, line ports 9–17 are in the next slot to the left, line ports 18–26 are in the next slot and so forth through line ports 65–72 located in the left-most universal slot. The main cabinet supports a total of 72 lines.

Line ports in the expansion cabinet begin at the right-most board slots with line ports 73–80 and ascend to the left at eight line ports per slot to end at the left-most universal slot with line ports 121–128. The expansion cabinet supports a total of 56 lines.

Station Port Location

On 16–station boards, station ports 1–8 appear at connector J1and station ports 9–16 appear at connector J2 on every analog station board.

The station ports for both the main and expansion cabinet assend from the leftmost universal board slot. This means that in the main cabinet, station ports 1–16 are in the leftmost universal board slot, station ports 17–32 are in the next universal boatd slot to the right, station ports 33–48 are in the next universal board slot and so forth through station ports 65–80 located in universal board slot five. The main cabinet supports a totol of 80 stations. Remember, if the system requires auxiliary boards, you must install them at universal slots one and two thus eliminating two station board locations.

Station ports in the expansion cabinet begin at the leftmost board slots with station ports 81–96 and assend to the right at 16 station ports per slot to end at the rightmost universal slot with station ports 177–192. The expansion cabinet supports a total of 112 stations.

Analog station ports are paired ODD/EVEN, beginning with the lowest port number 1/2, 3/4, etc., for data and for overload protection. The odd port is the positive voltage (+) port and the even port is the negative voltage (-) port.

3.9 Mounting Considerations

When installing the DXP digital communications system, take note of the following requirements (read Sections 3.9.1 and 3.9.2 to learn the mounting dimensions):

- Always choose a secure and dry mounting location that has plenty of ventilation. Be sure that the temperature range of the location is within 32-122 degrees F (0-50 degrees C) and that the humidity is less than 90 percent, non-condensing.

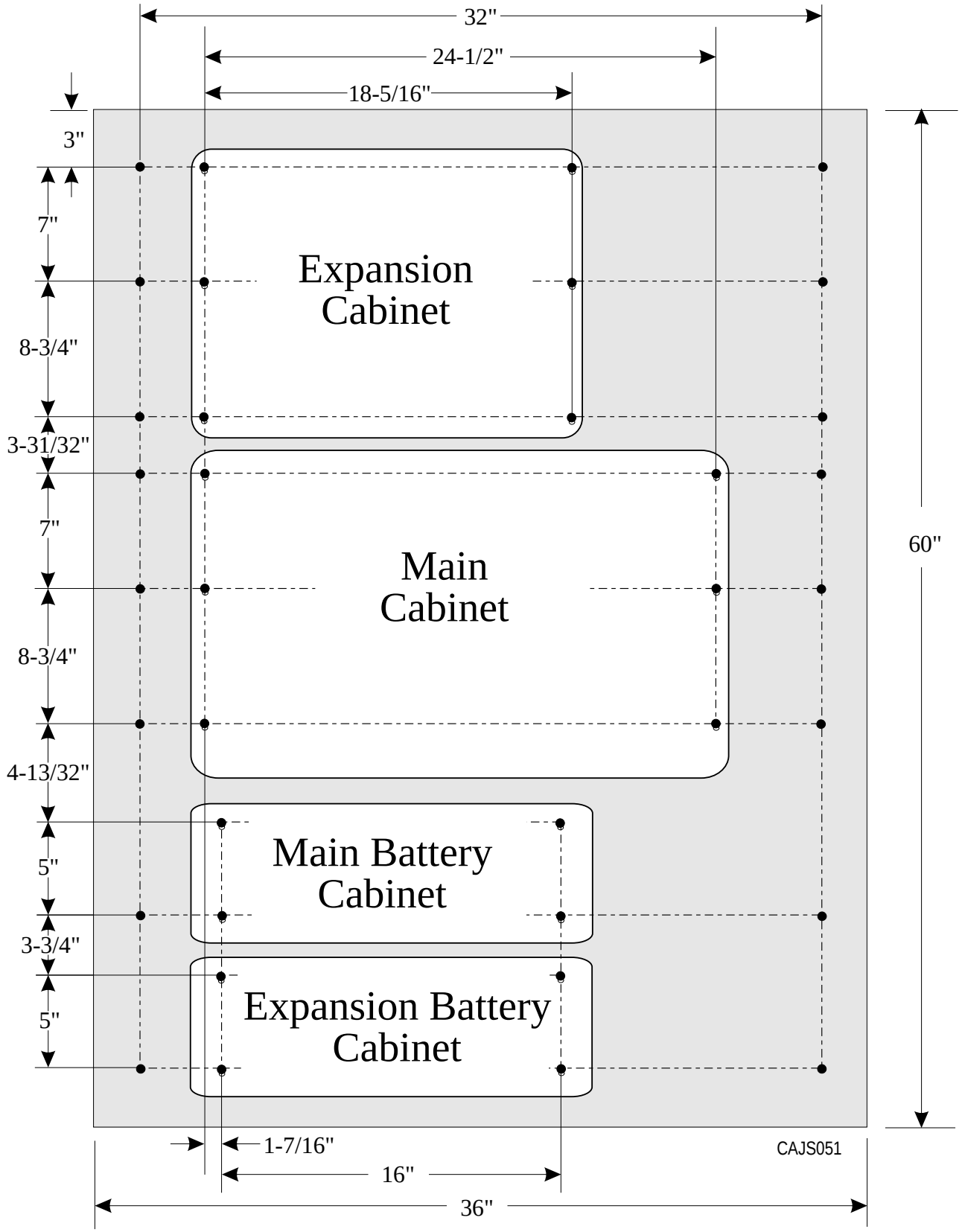
- Locate the equipment within four feet of a proper AC electrical outlet dedicated exclusively to this equipment. The outlet must be a 117 VAC 15 AMP circuit with a third-wire ground supplied to a standard electrical outlet (NEMA 5-15R)

- Locate the equipment within 25 feet of the TELCO/PBX jacks—this is an FCC requirement. A nominal distance of seven feet is ideal.

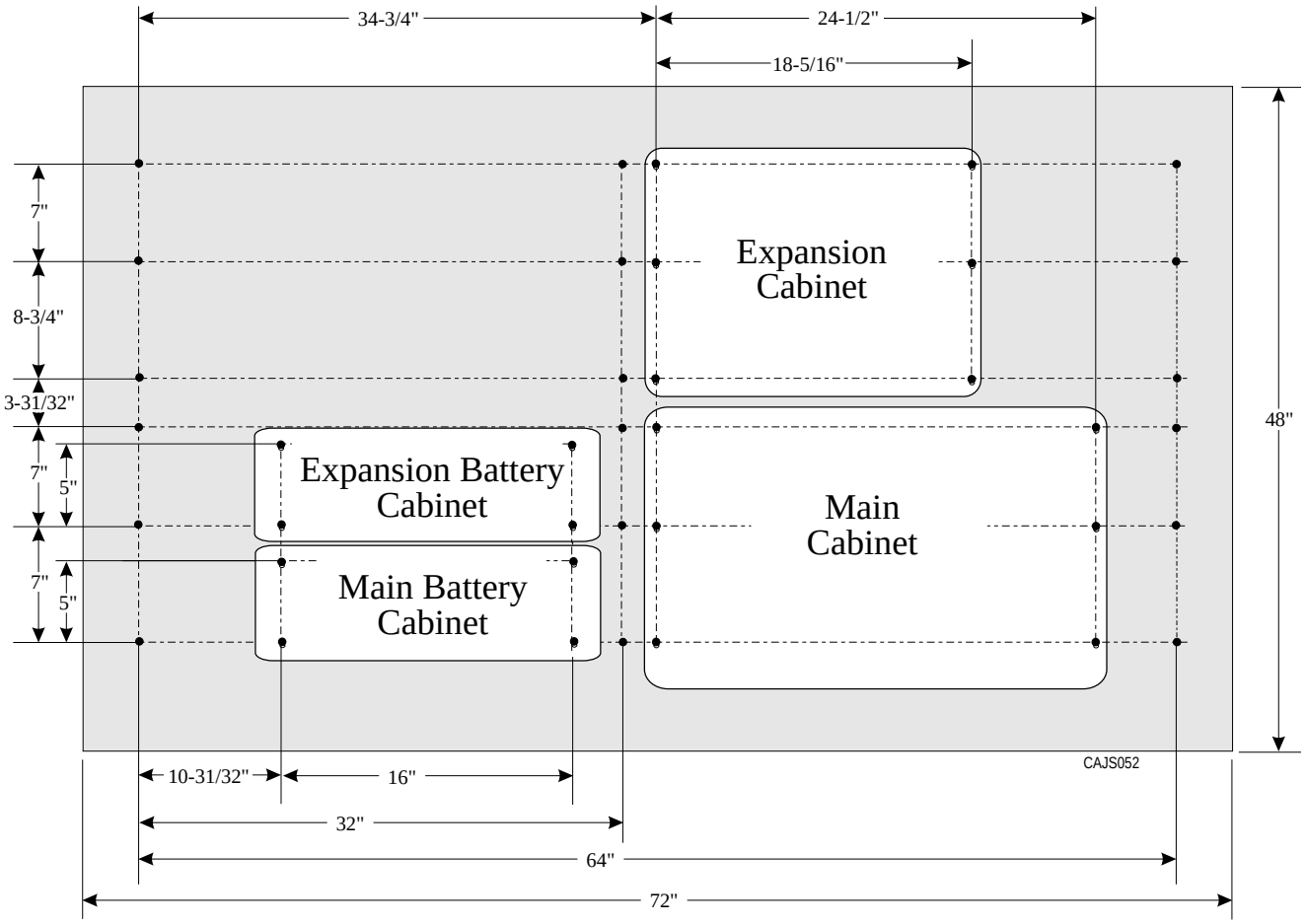
- Use a reliable earth ground—a metal cold water pipe ahead of any non-metalic couplings or junctions, or a metal building frame ground that is verified to be at earth ground potentional by measurement.

- Use a backboard of at least 3/4-inch thick plywood to mount the DXP common equipment. It is a good practice to make this backboard large enough to accommodate the main cabinet, the expansion cabinet, and a battery backup assembly even though the initial installation may not require all of this equipment. Always bridge underlying wall studs with the backboard and drive the attaching hardware through the backboard and through the underlying wall into the wall studs. Allow space between the top and bottom of the main cabinet for later placement of an expansion cabinet above the main cabinet.
  NOTE: You can mount the cabinet on a standard 23–inch equipment rack if you wish.

3.9.1 Detailing The Vertical Mounting Dimensions



3.9.2 Detailing The Horizontal Mounting Dimensions



3.10 Using The Power Supply

What the power supply does

Each cabinet in the DXP system has its own power supply. The power supply provides + and – 5 VDC operating power for the circuit boards and – 36 VDC for all of the telephone stations. Each power supply is located in the lower left corner of the respective cabinet.

Power supply requirements

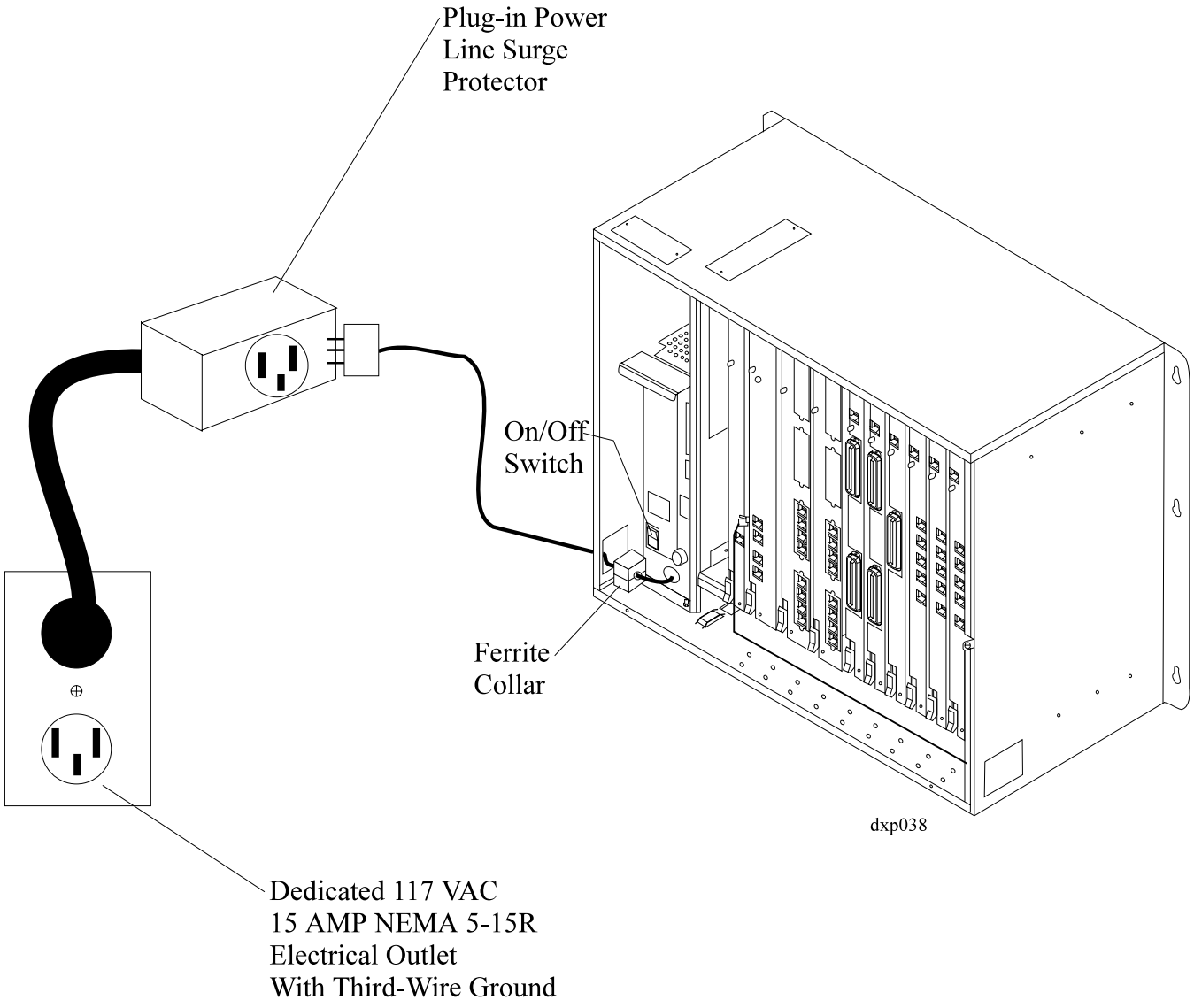
For the AC power connection, employ a dedicated 117VAC 15 AMP circuit, with a third-wire ground, supplied to a standard electrical outlet (NEMA 5-15R). Remember, this electrical outlet must be located within four feet of the common equipment cabinet.

To provide protection against surges and spikes that may appear on the AC line, install a plug-in power line surge protector between the AC power cord of the installed equipment and the AC outlet.

The common equipment cabinet employs an electronic switching power supply. During operation, power supplies of this type generate an audible sound from their switching regulators. This sound is normal and is not an indication that the power supply is operating improperly.

CAUTION

DO NOT attach or secure the line cord to the surface of the mounting location in any manner.



Detailing The Power Connections

3.11 Using The Battery Backup

What the battery backup does

Should the AC power to the system be interrupted, one external battery assembly provides 1.0 hour of operation for a fully loaded main cabinet or .5 hours for a fully loaded main and expansion cabinet. Adding a second battery assembly in parallel extends the time to a minimum of 2.0 hours for a fully loaded main cabinet or 1.0 hour for a fully loaded main and expansion cabinet.

During AC operation, the external battery assembly accepts re-charging current to maintain the voltage potential of its batteries at an operational level. The measured voltage the battery backup is 34.5 volts when the batteries are fully charged.

The charging circuit may not provide an adequate charge if an installed battery assembly has a current rating of greater than 40 ampere-hours.

One external battery assembly requires approximately 12 hours to completely re-charge to full potential after it has been completely discharged and, in some cases, when initially installed. Adding another battery assembly extends the required re-charge time to approximately 24 hours.

Battery backup components

You can only install two battery backup per system. The battery backup assembly includes the following items:

- Five 6–volt, 20 ampere-hour GC Portalac Model PE6V20*
  (Comdial product code BT000–131)
- Metal enclosure with wire harness, includes combination circuit breaker, on/off switch

**GC Portalac, City Of Industry CA, 91748*

How to calculate backup time

Calculate the minimum battery backup time provided by one battery backup assembly to a fully configured DXP system using the following formula:

T = Back-up time in hours
K = Constant:
  .6 for fully-loaded main cabinet
  .6 for fully-loaded main and expansion cabinet
e = Ampere-hour capacity of battery (BBLDX = 20)
N = total number of stations

$$T = \frac{Ke}{1 + [(0.13)(N)]}$$

Example:
DXP main cabinet with 80 stations and one BBLDX battery assembly

$$T = \frac{(.6)(20)}{1 + [(0.13)(80)]} = \frac{12.0}{11.4} = 1.05 \text{ Hour}$$

3.12 Understanding System Grounding Requirements

Transient voltage spikes, if induced onto CO or CENTREX lines, can travel through the cable and into the common equipment. The telephone company offers basic protection against this condition but it is usually designed to protect the central office circuits. While it will also provide some protection to the common equipment, you should not rely upon it for total protection. To help ensure that external over-voltage surges do not damage the system, installers should install and properly ground primary protection devices, such as gas discharge tubes or similar devices, on all lines. While the line boards have internal secondary surge protection on all line ports, in order for this protection to be effective, installers MUST connect the common equipment cabinet to a reliable, effective earth ground.

Proper DXP grounding is necessary for trouble-free operation and personnel safety. The DXP has the following three types of grounds:

- *Service Ground*—a neutral power line wire that is connected to the ground bus in the premises' AC power panel,
- *System Ground*—a non-current carrying power line wire that is connected to the ground bus in the premises' AC power panel,
- *Frame Ground*—a low impedance conductor that places the common equipment cabinet at reference ground potential. The frame ground provides the greatest safety by limiting electrical potential between non-current carrying parts of the system. The common equipment cabinet provides a ground stud on its cabinet for access to its frame ground.

Effective grounding requires that installers connect the frame ground to a good earth ground. A good earth ground is one such as the ground bus in the premises' AC power panel or a public metallic cold water pipe at a point immediately at its entrance to the premises and ahead of any meters, pumps, or insulating sections that have been added for vibration reduction. Installers must avoid using the premises' structural steel frame as it may not be at earth ground potential. Installers must make the ground connection between the main and expansion cabinets with #10 or #12 or larger size insulated, solid copper wire. They must make the connection between the main cabinet and the earth ground with #6 or larger insulated, solid copper grounding wire. They must keep the ground wire separate from the three-wire AC line cord, not splice it, and keep it as short as possible.

The impedance of the wiring between the DXP and the earth ground must not exceed 0.25 ohms and the impedance between the earth ground and the power company's reference standard ground must not exceed 5 ohms. Installers should use an acceptable low impedance measuring device to measure the impedance of these paths. The #6 or larger wire size will minimize the wiring impedance; however, if the impedance between earth ground and the power company's standard reference ground exceeds 5 ohms, someone must contact the local power company. The ground path must always be of sufficient current-carrying capacity to prevent a build up of voltages that may result in circuit noise, hazard to personnel, or equipment damage.

Installers must be sure that all of the ground connections are visible for inspection and maintenance, and they should tag all of the ground connections with a sign that reads: *Do Not Remove Or Disconnect.*

4 Connecting The System

4.1 Connecting The Lines

How to connect the lines

Line terminations to the line boards vary depending upon the line board type. Terminations for the loop start board are standard modular jack connections. Each jack on the loop-start board provides termination for two lines. Terminations for the loop start and the multipurpose boards are through a 50-pin amphenol-type connector, and the connection for the T1 board is an eight-pin modular jack. The demarcation point can be a type 66M-xx connector block or individual 6-position modular jacks. The wiring that you route between the demarcation-point and the line board termination should be #24 AWG or larger twisted-pair wiring (see figure 14 for line board connections).

How to protect the line connections

Transient voltage spikes, if induced onto CO or CENTREX lines, can travel through the cable and into the common equipment. The telephone company offers basic protection against this condition, but it is usually designed to protect the central office circuits. While this CO or CENTREX service will also provide some protection to the common equipment, you should not rely upon it for total protection. To help ensure that external over-voltage surges do not damage the system, Comdial engineers recommends that technicians install and properly ground gas discharge tubes, or similar primary protection devices, on all lines.

Each line board is shipped with a ferrite collar. Bundle the line cables together and snap the collar around the bundle to provide protection against radio frequency interference.

4.2 Connecting The Stations

How to connect the stations

Connections between the telephones and the station boards are typically via type 66M-xx connector blocks that are cable connected to the station boards.

The gauge size of the twisted-pair station wiring determines the maximum distance allowed from the common equipment to the stations.

Station Type	Wire Gauge		
	20 AWG	22 AWG	24 AWG
Digital Telephone	2500 Feet	2000 Feet	1500 Feet
Analog Multiline Telephone	2500 Feet	2000 Feet	1500 Feet
Analog Single-Line Proprietary Telephone	4000 Feet	3500 Feet	3000 Feet
Industry-Standard Telephone	4000 Feet	3500 Feet	3000 Feet

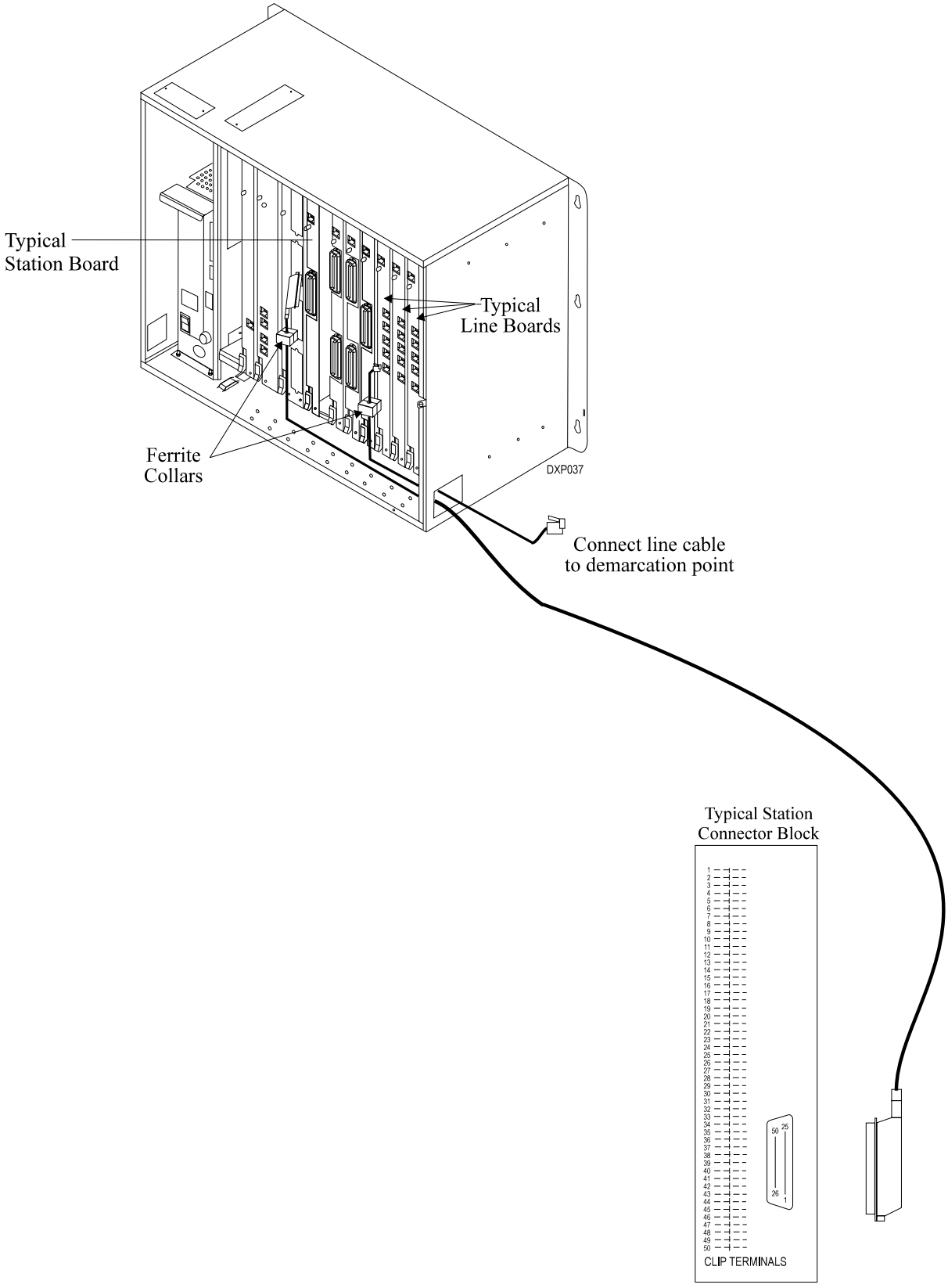
How to protect the station connections

If spare conductors exist in the cables that are run between the station boards and the 66M-xx connector blocks, it is a good practice to connect them to earth ground to help prevent them from inducing radio frequency and/or AC interference into the system.

Each station interface board is shipped with an appropriate supply of ferrite collars. Snap one of these around each station cable to provide protection against radio frequency interference.

Installing a DSS / BLF console

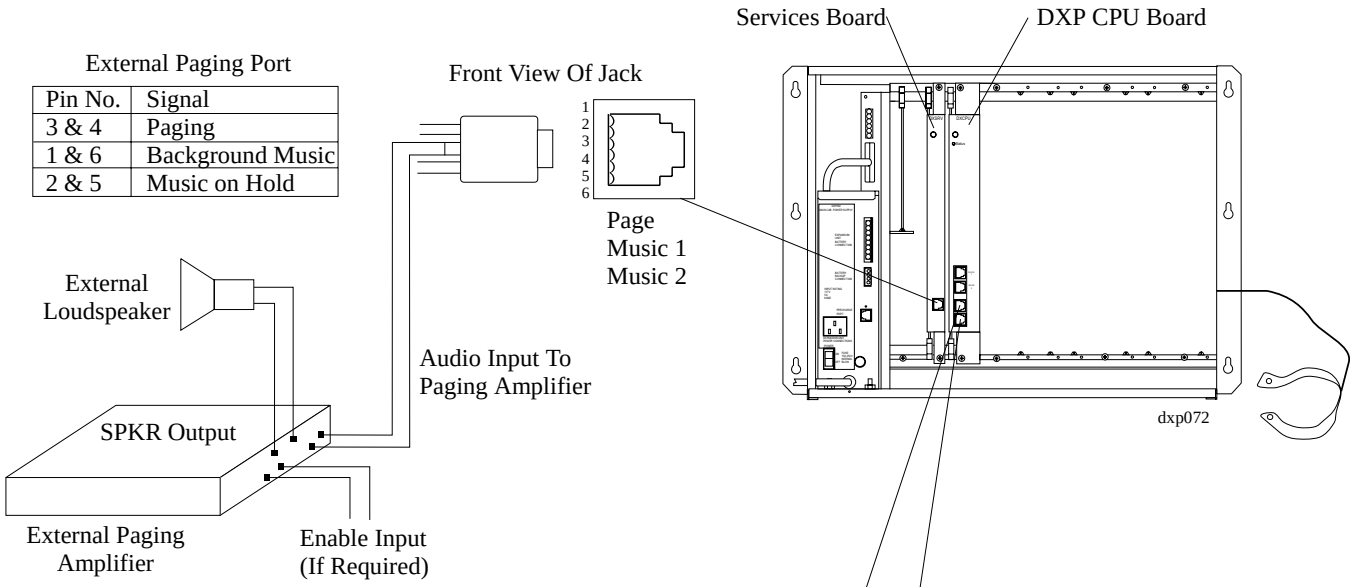
Install a DSS/BLF Console at any station in the system as a companion to a telephone. There is no limit to the maximum number of consoles that can be installed on a system. When you install a console, you must also define the station as a console with programming.



Viewing Typical Line And Station Connections

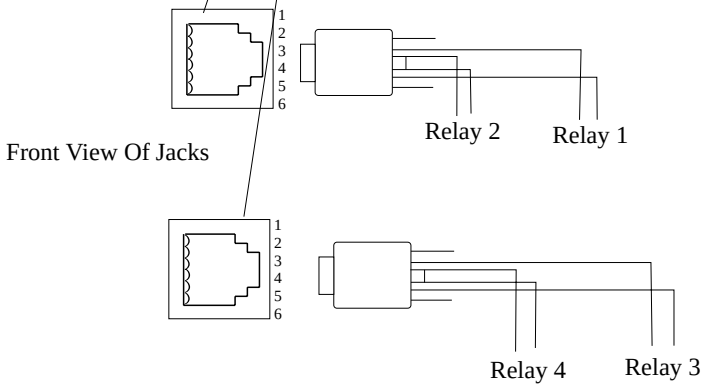
4.3 Connecting The Paging Equipment And Music Sources

The services board provides a standard 6-position modular jack for interfacing external paging equipment and external music sources to the DXP system. This jack supplies audio output from the DXP for paging purposes and accepts audio input from two separate audio sources.



Common Audible Interface Relays

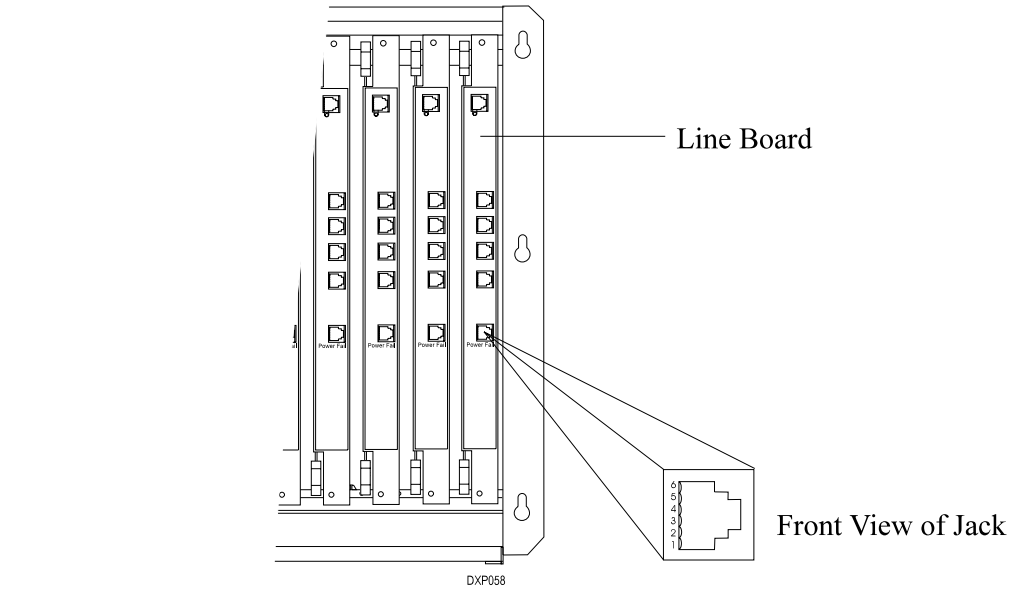
Relay Jack	Pin No.	Signal
J3	1	No Contact
	2	Relay 1
	3	Relay 2
	4	Relay 2
	5	Relay 1
	6	No Contact
J4	1	No Contact
	2	Relay 3
	3	Relay 4
	4	Relay 4
	5	Relay 3
	6	No Contact



Detailing The Paging And Music Source Interface

4.4 Connecting A Power Failure Telephone

Each line board provides one standard 6-position modular jack that interfaces an industry-standard telephone for power failure operation to line 1 of that board.



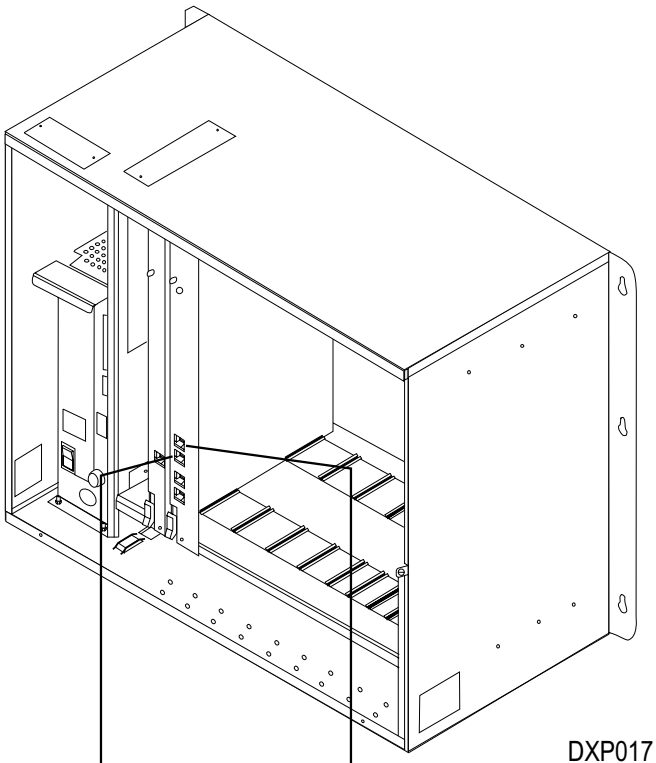


Connecting A Power Fail Telephone

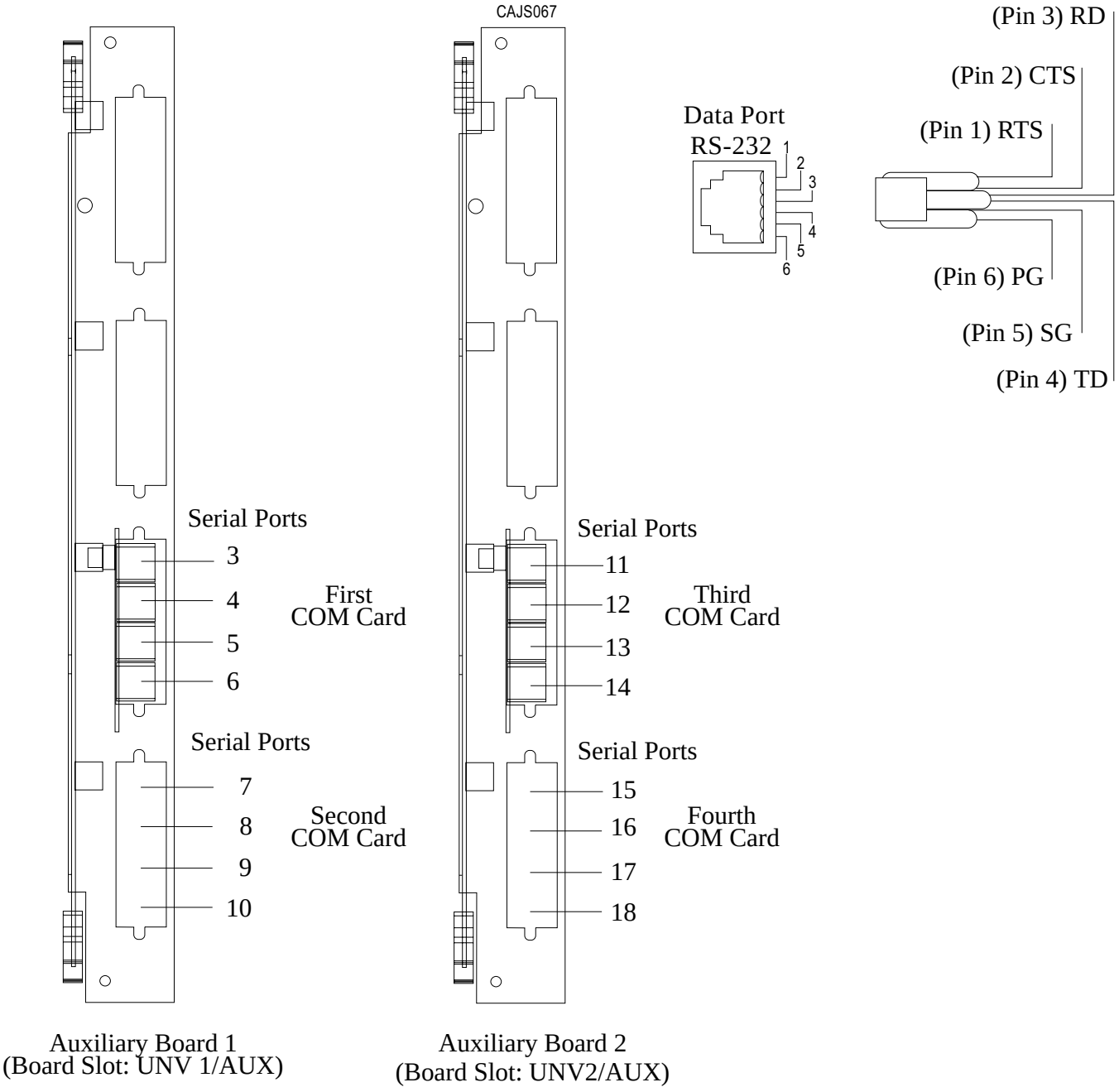
4.5 Connecting The Serial Data Ports

The CPU board provides two serial data ports. You can add as many as 16 additional data ports by adding up to two communications cards at lower two card slots on an auxiliary board. The following chart shows the locations for all of the non-dedicated serial data ports.

Serial Data Port Designation	Communications Card Locations
Serial Data Ports 3–10	Lower two slots on the auxiliary board installed at the UNV1/AUX board slot
Serial Data Ports 11–18	Lower two slots of one of the auxilary board installed at the UNV2/AUX board slot
In order to use all 16 auxiliary serial data ports you must install four communications cards.	



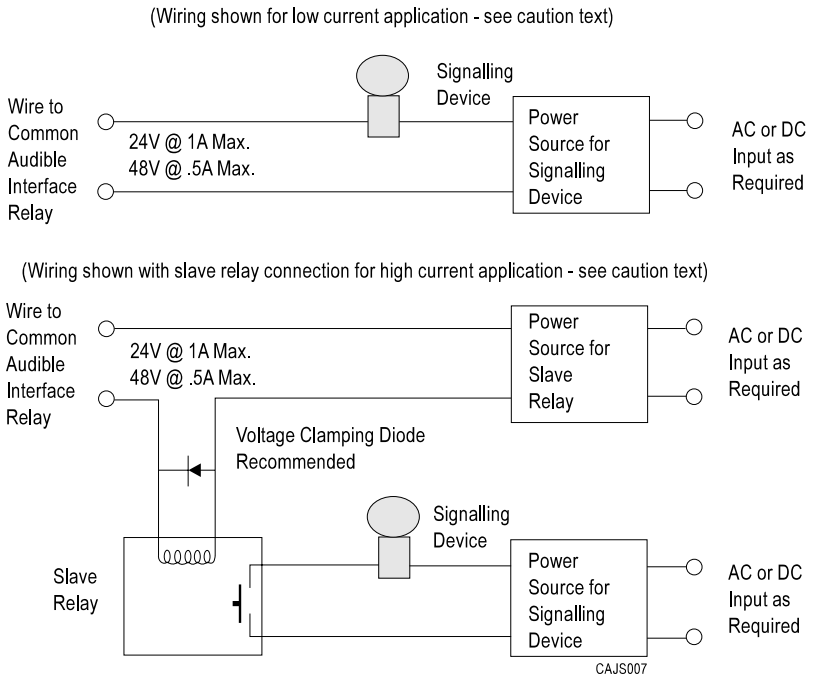
Locating Serial Data Ports 1 And 2

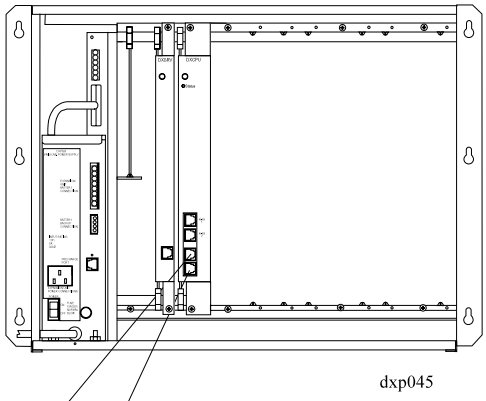


Locating Serial Data Ports 3 through 18

4.6 Connecting The Slave Equipment Requiring Dry-Contact Relay Closure For Actuation

The CPU board provides dry-contact relay closures that are under software control.

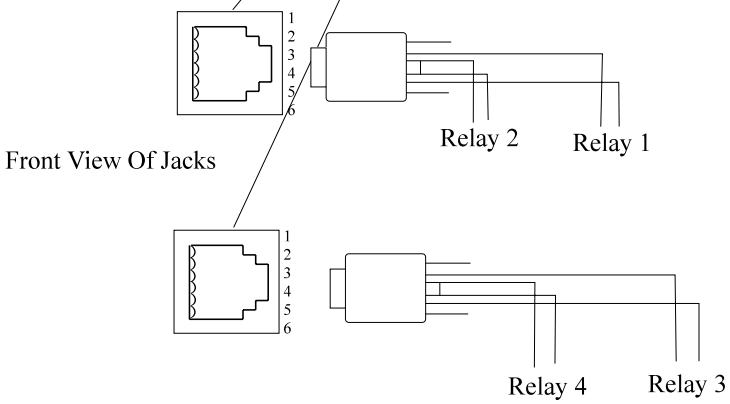

(Wiring shown for low current application - see caution text)
Signalling Device
Wire to Common Audible Interface Relay
24V @ 1A Max.
48V @ .5A Max.
Power Source for Signalling Device
AC or DC Input as Required
(Wiring shown with slave relay connection for high current application - see caution text)
Wire to Common Audible Interface Relay
24V @ 1A Max.
48V @ .5A Max.
Power Source for Slave Relay
AC or DC Input as Required
Voltage Clamping Diode Recommended
Signalling Device
Slave Relay
Power Source for Signalling Device
AC or DC Input as Required
CAJS007



Common Audible Interface Relays

Relay Jack	Pin No.	Signal
J3	1	No Contact
	2	Relay 1
	3	Relay 2
	4	Relay 2
	5	Relay 1
	6	No Contact
J4	1	No Contact
	2	Relay 3
	3	Relay 4
	4	Relay 4
	5	Relay 3
	6	No Contact

Relay 1 = Normally Closed
Relay 2-4 = Normally Open



Showing The Relay Port Details

5 Knowing The Specifications

- ***Maximum System Capacities***

Attendant Consoles:

Telephone Attendant	Unlimited
Personal Computer Attendant	4

Conferencing: (Simultaneous–without conference circuit board)

	1 five-way plus 2 SOHVA, or 1 four-way plus 2 three-way, or 4 three-way plus 1 SOHVA
With optional conference circuit board	5 three-way conferences per board

DSS/BLF Consoles:

Assigned To Each Station	4 (Each console uses a separate station port)

Intercom:

Conversations (Simultaneous)	Non-blocking
Paths	Non-blocking
Stations Assigned To Same Group Intercom Number	192
Simultaneous Rings On Same Group Intercom	192

Lines: 72 (main cabinet capacity)
56 (expansion cabinet capacity)

Line Groups (With unlimited members): 16

Paging:

External Paging Ports	1 plus 4 relays
Internal/External Paging Zones or All Call	8
Station Capacity Per Zone	192

Park Orbits: 9

- **Maximum System Capacities—continued**

Power Fail Circuits:	One per line board
Ringing Capacities (Simultaneous):	
Proprietary Telephones	192
Industry- Standard Telephone ring per phase	96 (48 with bridged ISTs)
Subdued Off-Hook Voice Announce Groups:	
Receive	16
Transmit	16
SMDA Call Storage Capacity:	
(with standard memory card installed)	200 records
(with required DXRAM-EXP68K expanded memory card installed)	Approximately 12200 calls
Speed Dials:	
System Speed Dial	500 maximum
Station Speed Dial Numbers Per Set	10
Station Speed Dial Sets Per Station	3 at default , 1 minimum, 10 maximum
Speed Dial Sets Per System	616
Stations:	80 (main cabinet) 112 (expansion cabinet)
Station Class Of Service:	32
Toll Restriction Table Entries:	400
Traffic Capacities:	36 CCS (1 Erlang), non-blocking

- ***Power Requirements***
  (Fully Loaded Main Cabinet, Fully Loaded Expansion Cabinet)

Domestic AC Power Supply	90–129 VAC Single phase - all models 5A 432W 530VA
International Power Supply	90–129 VAC at 50/60 Hz, internally switchable, 200–254 VAC at 50 Hz 5A 432W 530VA (Approved to IEC 950 International Safety Standards)
Battery Back-up Reserve Power	1 Hour minimum for fully loaded system (System without expansion cabinet and with BBLDX external battery assembly)

- **Dimensions *(approximate)***

Main Cabinet:	
Width (inches)	26.0
Height(inches)	19.0
Depth (inches)	12.0
Weight (approximate pounds)	42 (with cabinet, board cage, and backplane) 72 (with power supply and circuit boards added)
Expansion Cabinet:	
Width (inches)	19.75
Height(inches)	19.0
Depth (inches)	12.0
Weight (approximate pounds)	60 (includes cabinet, board cage, backplane, power supply, and circuit boards)

- ***Station Cable Requirements***

Cable Type	#24 AWG minimum 2-wire (1-pair) twisted, non-shielded for IST 2-wire (1-pair) twisted, non-shielded for proprietary digital telephones 4-wire (2-pair) twisted, non-shielded for proprietary analog telephones 6-wire (3-pair) twisted, non-shielded for proprietary analog telephones with SOHVA

Maximum Length	With 20 AWG	With 22 AWG	With 24 AWG
–digital telephone	2500 feet	2000 feet	1500 feet
–analog multiline telephone	2500 feet	2000 feet	1500 feet
–single line proprietary telephone	4000 feet	3500 feet	3000 feet
–IST telephone	4000 feet	3500 feet	3000 feet

- ***Operating Environment***

Temperature	32-122 degrees F (0-50 degrees C)
Humidity	90 percent relative, non-condensing
Heat Dissipation (Fully loaded main cabinet)	1474 BTUs per hour
Heat Dissipation (Fully loaded expansion. cabinet)	1474 BTUs per hour

- ***Terminations***

Station:	Standard 50-pin male connectors for connection to external distribution field.
Line:	Standard, 6-conductor mini-jack (USOC 14C)

- ***RS-232 (Data) Port***

Ports On CPU board	2 at 9600 bps
Ports ON comm. card	4 at 1200 bps
Format	Serial, pseudo RS-232C
Parity	None, Even, Odd (Programmable)
Data Bits	7 or 8 (programmable)
Stop Bits	1 or 2 (programmable)
Baud Rate	Programmable in class of service
Handshaking	X on – X off, Hardware—CTS and RTS, None
Cable Length (CPU board ports)	500 Feet

- ***Music Interfaces (Background and MOH):***

Input Level	3 Volts peak-to-peak maximum
Input Impedance	Approximately 500 Ohms
Connector	Modular jack

- ***PA Port***

Output Level	400 Millivolts peak-to-peak (typical speech)
Output Impedance	Approximately 500 Ohms
Connector	Modular jack

- ***Central Office Limits***

Loop Limits	1900 Ohms maximum loop
Cable Insulation Leakage	15,000 Ohms minimum

- ***Industry/Regulatory Standards***

FCC Certified, Part 15 (Class A)
FCC registered (fully protected)
LISTED by OSHA-accredited, nationally recognized, test laboratory
EIA RS478
Bell publication 48002 guidance
Hearing aid compatible handset

- ***Memory Retention After Power Loss***

65 hours typical -without battery back up
(memory retained by "super cap" device on RAM card)

- ***FCC Requirements***

Registration Number

Key System	CVWUSA-65214-KF-E (KS Registration)
Hybrid System	CVWUSA-65213-MF-E (MF Registration)

Network Specifications	Loop Start	Ground Start*	DID	E&M
Service Order Code	9.0F	9.0F	9.0F-AS.2	9.0F
Facility Interface Code	02LS2	02GS2	02RV2-T	TL11M
USOC Connectors	RJ21X	RJ21X	RJ21X	RJ2EX
Ringer Equivalence Number	0.4B	0.4B	n/a	0.4B

**State tariffs do not permit ground start lines for key system configurations (KF registration). Systems must be hybrid configured (MF registration) if they use ground start lines.*

- ***Product Codes***

Main Cabinet	DXCBM
Expansion Cabinet	DXCBX
Power Supply (main)	DXPSM
Power Supply (expansion)	DXPSX
Interface Board (main)	DXINM
Interface Board (expansion)	DXINX
Services Board	DXSRV
Central Processor Unit Board	DXCPU-68K
Auxiliary Board	DXAUX
Conference Boards	DXCNF
Communications Card	DXOPT–COM
Digital Station Board	DXDST–8
	DXDST–16
Analog Station Board	DXAST– 8
	DXAST–16
Industry Standard Station Board	DXIST–16
	DXIST– 8
Loop Start Line Board	DXPCO–LP4
	DXPCO–LP8
DID Line Board	DXPCO–DD8,–DD4
Multipurpose Line Board	DXPCO–GD4,– GD8
T1 Line Board	DXPT1

Random Access Memory Card	DXRAM–STD68K
Expanded RAM Card	DXRAM– EXP68K
Ring Generator For IST	DXRNG
Software Card–EPROM, System software program)	DXPSW–xxxDLR rev nn DXPSW–xxxEXE rev nn
DTMF Receiver Card	DXOPT–TON
Modem	DXMDM
Main Cabinet Package (Includes: Main Cabinet, Main Power Supply, Services Board, CPU Board, Modem.)	DXBKM
Expansion Cabinet Package (Includes: Expansion Cabinet, Expansion Power Supply, Expansion Interface Board—for main cabinet, Expansion Interface Board—for expansion cabinet .)	DXPKX

- ***Ringing Cadences***

Digital Intercom Ring	150 msec. on, 75 msec. off, 4 sec. between rings
Digital Trunk Ring	450 msec. on, 75 msec. off, 4 sec. between rings
Digital Recall Ring	275 msec.—300msec. on, 4 sec. between rings
Digital Camp–on Recall Ring	150 msec. on, 75 msec. off
Analog Intercom Ring	300 msec. on, 150 msec. off, 3.5 sec. between rings
Analog Trunk Ring	900 msec on, 125 msec off, 3.5 sec. between rings
Analog Recall Ring	500 msec. on, 3.5 sec. between rings
Analog Camp–on Recall Ring	300 msec. on, 150 msec off

5.1 Knowing The FCC Rules And Regulations

This electronic key system complies with Federal Communications Commission (FCC) Rules, Part 68. The FCC registration label on the DXP Plus contains the FCC registration number, the ringer equivalence number, the model number, and the serial number or production date of the system.

Notification To Telephone Company

Unless a telephone operating company provides and installs the system, the telephone operating company which provides the lines must be notified before a connection is made to them. Provide the telephone company with the lines (telephone numbers) involved, the FCC registration number, the ringer equivalence number, the Facilities Interface Code (FIC), the Universal Service Ordering Code (USOC), and the USOC jack required. The FCC registration number and the ringer equivalence number is provided on the label attached to the common equipment. The FIC and USOC information is provided in the equipment's general specifications found in equipment system manual. The user/installer is required to notify the telephone company when final disconnection of this equipment from the telephone company line occurs.

Compatibility With Telephone Network

When necessary, the telephone operating company provides information on the maximum number of telephones or ringers that can be connected to one line, as well as any other applicable technical information. The telephone operating company can temporarily discontinue service and make changes which could affect the operation of this equipment. They must, however, provide adequate notice, in writing, of any future equipment changes that would make the system incompatible.

Installation Requirements

Connection of the electronic key system to the telephone lines must be through a universal service order code (USOC) outlet jack supplied by the telephone operating company. If the installation site does not have the proper outlet, ask the telephone company business office to install one. The correct outlet jack for this system is either a type RJ21X or type RJ14C.

Party Lines And Coin Lines

Local telephone company regulations may not permit connections to party lines and coin lines by anyone except the telephone operating company.

Troubleshooting

If a service problem occurs, first try to determine if the trouble is in the on-site system or in the telephone company equipment. Disconnect all equipment not owned by the telephone company. If this corrects the problem, the faulty equipment must not be reconnected to the telephone line until the problem has been corrected. Any trouble that causes improper operation of the telephone network may require the telephone company to discontinue service to the trouble site after they notify the user of the reason.

Repair Authorization

FCC regulations do not permit repair of customer owned equipment by anyone except the manufacturer, their authorized agent, or others who might be authorized by the FCC. However, routine repairs can be

made according to the maintenance instructions in this publication, provided that all FCC restrictions are obeyed.

Radio Frequency Interference

The electronic key system contains incidental radio frequency generating circuitry and, if not installed and used properly, may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference to radio and television reception; in which case the user is encouraged to take whatever measures may be required to correct the interference. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient the television or radio's receiving antenna, and/or relocate the DXP Plus, the individual telephone stations, and the radio or TV with respect to each other. If necessary, the user should consult the manufacturer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the Government Printing Office, Washington D.C. 20402. Stock No. 004-000-00345-4.

This digital apparatus does not exceed the (Class A) limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le pre'sent appareil nume'rique n'emet pes de bruits radioe'lectriques de'passant les limites applicables aux appareils nume'riques (de la class A) prescrites dans le Re'glement sur le brouillage radioe'lectrique e'dicte' par le ministe're des Communications du Canada.

Ringer Equivalence Number

The REN of each line is 0.4B. The FCC requires the installer to determine the total REN for each line, and record it at the equipment.

6 Understanding The Features

6.1 DXP Features List

This list details all of the features available on the DXP. Use it as a pre-installation check list.

- ☐ Abandoned Hold Release
- ☐ Adjunct Feature Module
- ☐ Access Denied
- ☐ Account Code Button
- ☐ Account Codes With Positive Verification
- ☐ All Call Paging
- ☐ Allow Ringer Off *(Ringer Volume Off)*
- ☐ Alpha-Numeric Calling Party and Line Display
- ☐ Alternate Attendant
- ☐ Answer Button
- ☐ Area Paging Interface
- ☐ Attendant Position
- ☐ Attendant Position, PC
- ☐ Authorization Code
- ☐ Automatic Dialing
- ☐ Automatic Hold - Intercom To Intercom/Line
- ☐ Automatic Hold - Line To Intercom
- ☐ Automatic Hold - Line To Line
- ☐ Automatic Pause Insertion
- ☐ Automatic Privacy
- ☐ Automatic Number Identification (ANI)
- ☐ Automatic Redial
- ☐ Automatic Reports
- ☐ Automatic Route Selection
- ☐ Automatic Station Relocation
- ☐ Auxiliary Equipment Interface
- ☐ Auxiliary Station Ringer Interface
- ☐ Background Music*
- ☐ Battery Backup (Chassis, Cable, and Batteries)
- ☐ Battery Backup Interface
- ☐ Block Programming
- ☐ Busy Button Inquiry
- ☐ Busy On SOHVA
- ☐ Button Query
- ☐ Call Announce Beeps
- ☐ Call Announce With Handsfree Answerback
- ☐ Call Costing and SMDA Reports
- ☐ Call Forward - All Or Personal
- ☐ Call Forward- Immediate
- ☐ Call Forward - Busy Or RNA, All Or Personal
- ☐ Call Park
- ☐ Call Park Recall
- ☐ Call Pick-Up - Directed
- ☐ Call Pick-Up - Group
- ☐ Call Pick-Up - System
- ☐ Call Transfer - Screened
- ☐ Call Transfer - Unscreened With Automatic Camp On
- ☐ Call Waiting Tone
- ☐ Caller ID
- ☐ Caller ID–RNA
- ☐ Camp-On With Automatic Call Back
- ☐ Camp-On - Call Waiting
- ☐ Camp-On - No Answer
- ☐ Clear Major Alarm Ring
- ☐ Central Message Desk
- ☐ Central Processor Switched Data Port Configuration
- ☐ Centrex Compatible
- ☐ Common Audible Ringer Interface
- ☐ Conference Advisory Tone
- ☐ Conferencing - Multiline
- ☐ Console Support
- ☐ Console-Less Operation
- ☐ Communications Card Support
- ☐ Consultation Hold
- ☐ Copy Model
- ☐ Data Base Program Storage Via PC Interface
- ☐ Data Base Programming From Main Station (Limited)
- ☐ Data Base Programming With Personal Computer And Visual Man Machine Interface (VMMI) Software
- ☐ Day One and Day Two Ringing
- ☐ Default Busy/RNA Call Forward
- ☐ Default Functional Programming
- ☐ Delayed Ringing
- ☐ Dial 0 for System Attendant
- ☐ Dial Plus Interdigit Time
- ☐ Digital Voice Announce
- ☐ Dialed Number Identification Service (DNIS)
- ☐ Digital Wireless Telephone Support
- ☐ Direct Inward Dialing (DID)
- ☐ Direct Inward System Access (DISA)
- ☐ Direct Line Access by Station
- ☐ Direct Line Group Selection
- ☐ Directed Station Hold
- ☐ Disconnect Supervision
- ☐ Discriminating Ringing
- ☐ Do Not Disturb
- ☐ Do Not Disturb Inhibit
- ☐ Do Not Disturb Override
- ☐ DSS Status Button
- ☐ Dynamic Save Button
- ☐ E&M tie Line support
- ☐ End to End DTMF Signalling
- ☐ End to End Signalling on Intercom
- ☐ End to End Signalling on Lines
- ☐ Enhanced LCD Display
- ☐ Exclusive Hold
- ☐ Executive Override
- ☐ Executive Override Block
- ☐ Executive Override Advisory Tone
- ☐ Extended DTMF Tonest

- ☐ Existing Comdial Telephone Support
- ☐ ExecuMail Integration
- ☐ External Paging Interface
- ☐ Feature Inhibit
- ☐ Feature Renumbering
- ☐ Flexible Ringing Assignment
- ☐ Flexible Ringing Assignment Of The External Paging Port
- ☐ Flexible Station Numbering Plan
- ☐ Ground Start Lines
- ☐ Group Intercoms
- ☐ Handsfree Answer Inhibit
- ☐ Handset Volume Control
- ☐ Headset Capability
- ☐ Hold
- ☐ Hold, Exclusive
- ☐ Hold Queuing
- ☐ Hold Time Reporting
- ☐ Hot Transfer
- ☐ I Hold and I Use Indications
- ☐ Idle Line Preference
- ☐ Idle Line Priority
- ☐ Industry Standard Telephone Support
- ☐ IST Offhook Treated As Busy
- ☐ IST Message Wait Retrieval Access Code
- ☐ IST Ring Frequency
- ☐ IST Ring Patterns
- ☐ Interactive Button Support
- ☐ Intercom Call Progress Tones
- ☐ Intercom Hunt List
- ☐ Intercom Interdigit Dialing Time-out
- ☐ Intercom Time-out
- ☐ Intercom Number
- ☐ Key/Hybrid Configuration
- ☐ Last Number Redial
- ☐ Line Access Restriction
- ☐ Line Answer From Any Station
- ☐ Line Appearance, Enhanced
- ☐ Line Groups
- ☐ Line Group Access
- ☐ Line Names
- ☐ Line Out Softkey Option
- ☐ Line Queuing
- ☐ Liquid Crystal Display (LCD) Messaging
- ☐ Liquid Crystal Display (LCD) Support
- ☐ Location Code
- ☐ Lock Button
- ☐ Manual Exclusion
- ☐ Manual Reset
- ☐ Master Clear
- ☐ Maximum Call Duration
- ☐ Meet-Me Answer Page
- ☐ Memory Retention Without Batteries
- ☐ Message Deposit
- ☐ Message Waiting
- ☐ Mnemonic Programming
- ☐ Modem Support
- ☐ Modify Digits Table
- ☐ Multiple Attendant Positions
- ☐ Multipurpose Line Board
- ☐ Music Interface*
- ☐ Music On Hold*
- ☐ Mute
- ☐ Names (Stations And Lines)
- ☐ Night Service Automatic Switching
- ☐ Night Transfer (Of Ringing)
- ☐ Off-Premise Extension (OPX)
- ☐ On-Hook Dialing
- ☐ Operator Station
- ☐ Originating Denied
- ☐ Out Dial Delay Time
- ☐ Password Protection
- ☐ Pause Time
- ☐ PBX/Centrex/Central Office Compatible
- ☐ Personal Intercom Number
- ☐ Paging Access
- ☐ Periodic Line Tone
- ☐ Personal Intercom Number Preference
- ☐ Personalized Ringing Tone
- ☐ Pooled Line Access
- ☐ Power Failure Transfer
- ☐ Preselection Prime Line
- ☐ Printer Interface
- ☐ Privacy
- ☐ Privacy Release
- ☐ Private Lines
- ☐ Program Printout
- ☐ Programmable Button Flexibility
- ☐ Programming Port
- ☐ Pulse/Tone Switchable
- ☐ Quick Transfer
- ☐ Remote Programming and Diagnostics
- ☐ Remote Station Disable
- ☐ Release Button
- ☐ Reminder Alert
- ☐ Restrict ARS Hookflash *(Automatic Route Selection, Hookflash Restriction)*
- ☐ Restricted Dial Error Tone
- ☐ Response Messaging
- ☐ Ringback On Busy
- ☐ Ringback On Transfer
- ☐ Ring Back Tone
- ☐ Ring No Answer Call Forward
- ☐ Ring On Busy
- ☐ Ringing Line Preference
- ☐ Save Button Dial Storage
- ☐ Saved Number Redial
- ☐ Secure Account Code Display
- ☐ Self Diagnostics
- ☐ Serial Data Port
- ☐ Service Observing
- ☐ Shift Button
- ☐ Silent Mode Button
- ☐ Single-Line Proprietary Telephone Support
- ☐ SMDA Reports
- ☐ SOHVA Beeps *(SOHVA Tone Bursts)*
- ☐ Speakerphone Support
- ☐ Split Button
- ☐ Square/Non-Square Configuration
- ☐ Station Hunting
- ☐ Station Class Of Service
- ☐ Station Message Detail Accounting (SMDA)
- ☐ Station Message Detail Recording (SMDR)
- ☐ Station Monitoring with DSS Call Pickup
- ☐ Station Names
- ☐ Station Speed Dial
- ☐ Subdued Off-Hook Voice Announce
- ☐ Subdued Off-Hook Voice Announce Groups
- ☐ Subdued Ringing
- ☐ Synchronized Ringing
- ☐ System Clock
- ☐ System Speed Dial
- ☐ System Status Reports
- ☐ T1 Digital Carrier Transmission Option
- ☐ Tap (Flash)/Recall
- ☐ Telephony Services Application Programming Interface (TSAPI) Support
- ☐ Through Dialing
- ☐ Tie Lines
- ☐ Time And Date
- ☐ Timed And Immediate Recall
- ☐ Toll Restriction
- ☐ Toll Restriction Pause Entries
- ☐ Tone or Voice Signalling on Internal Calls
- ☐ Transfer/Conference Button
- ☐ Transfer Ring Cadence
- ☐ Unsupervised Conference
- ☐ Voice Announce Blocking
- ☐ Voice Mail Integration Digits
- ☐ Zone Paging

** The system is equipped with two inputs for separate customer-supplied music sources.*

6.2 Defining The Features

The following section defines all of the DXP features. Read through all of these definitions before programming the DXP to ensure that you are programming the desired feature.

A

Abandoned Hold Release

If a distant on-hold party hangs up, it may cause an interruption in the line current. The DXP system then drops the line from the hold condition and returns it to service. You can program the time interval between hang-up and line-drop with choices of either 50 milliseconds or 350 milliseconds. The central office makes the arrangement for the time choice. Also refer to the discussion titled, Disconnect Supervision.

Access Denied

If you have programmed the system to do so, it can deny access to particular lines and group intercoms at certain telephones. A user cannot select a line for use if it is access denied at his or her telephone.

Account Code Button

As part of the button mapping, the system installer can assign a special button that the user may use to apply an account code to a call. Refer to the discussion titled Account Codes With Positive Verification.

Account Codes With Positive Verification

Station users can assign account codes to specific calls. The system uses the account codes to identify calls by category, or special grouping, for call accounting purposes. All calls with the same account code are reported together by the station message detail accounting (SMDA) feature. The system attendant can obtain a separate printout of calls assigned to one account without causing any other calls to print or be deleted. The programmer can arrange for the system to verify that the user entered an account code and to sound an error tone if an invalid account code is entered. If the programmer arranges it, attendants can use account codes as a basis for SMDA print-outs. He or she may program the system to prompt station users to enter account codes for incoming calls and/or out-going calls if desired. The prompt can be with or without system verification of the entry. Alternately, account code prompting can be turned off completely. Depending upon the type of call, different users are associated with the call accounting record. The following list explains to whom the call record is associated:

- On out-going calls, the user who enters the account code
- On transferred calls, the transferee
- On incoming calls, the last user active on a call.

Account codes may be from three to 16 digits in length as set by class of service programming. The system will verify all digits. Also refer to the discussion titled Account Codes With Positive Verification—forced.

Account Codes With Positive Verification—Forced

Station users can assign account codes to specific calls. The system uses the account codes to identify calls by category, or special grouping, for call accounting purposes. If the programmer programs the system to have forced account codes, the user must enter the account code before the call can be placed. If the system does not find a match between a user entered account code and one that the programmer has set in the system, the call will not be allowed. Remember, verification alone does not deny users' calls, only forced verification denies. The programmer can arrange for the system to verify that the user entered an account code and to sound an error tone if an invalid account code is entered. If the programmer arranges it, attendants can use account codes as a basis for SMDA print-outs. He or she may program the system to prompt station users to enter account codes for incoming calls and/or out-going calls if desired. You can program the system to recognize emergency numbers that do not require account codes.

Account Code Display And Display Time

For LCD speakerphone users, a message appears in the telephone's display prompting the user to enter an account code for incoming or outgoing calls. If the user does not require this prompt, the programmer should turn off the prompting message display.

Adjunct Feature Module Support

When the installer includes a 16-button adjunct feature module with certain model Comdial proprietary telephones, that module extends the programmable buttons of the telephone by 16 buttons and status lights. The users can program these buttons for speed dialing and direct station selection (DSS) with busy lamp field (BLF) status lights.

All-Call Paging

Refer to the discussion titled *Zone Paging.*

Allow Ringer Off (Ringer Volume Off)

On some proprietary telephones, the user selects the ringer volume level by pressing a rocker-type volume control repeatedly to select one of four different volume levels. The lowest volume setting is essentially an off condition as the telephone sounds only one low-volume ring burst when a call rings the station. Sometimes users would rather not receive even one ring burst. For these cases, installers can program the system so that it completely silences the ringer at a telephone when its user selects the lowest volume setting.

Alpha-Numeric Calling Party And Line Display

An LCD speakerphone, when receiving an inside call, displays the caller's name (up to seven characters), for example, "John L". The system uses the remaining nine characters on the display for status messages (for example, "Fwd from"). The system also displays the logical line number of the current line. Also see the discussion titled *Liquid Crystal Display Support*.

Alternate Attendant

Refer to the discussion titled *Attendant Position*.

Answer Button

When you map a telephone with this button, the user can press it to answer the call that is audibly ringing at his or her station. It is possible for more than one call to be ringing at the same time; however, only one of the first ringing calls is answered with the answer button.
Also refer to the discussion titled *Programmable Button Flexibility.*

Area Paging Interface

Refer to the discussion titled *External Paging Interface*.

Attendant Position

The attendant of a telephone system is typically the first person to answer an incoming call and usually directs incoming calls to the proper person or department within the system. In addition to call control, the attendant controls system-wide operating features such as night transfer (of ringing) and the system clock. Additionally the attendant is responsible for programming such items as system speed dial numbers and LCD messages that are available to many of the system users.

The DXP provides two attendant positions at default (stations 1 and 2, intercom 101 and 102); however, the programmer can assign any or all stations as attendant stations if they wish. The attendant can also assign up to four DSS/BLF consoles to each attendant position where needed. In addition to the many programmer–enabled feature buttons that the system can make available at any station, the DXP provides the attendant position with several special purpose programmer-enabled feature buttons to enhance call processing. These special purpose buttons are described below.

Alternate Button

When an attendant presses this button, all calls that are normally routed to his or her telephone now route to an alternate attendant's telephone instead.

Both Button

The *both* button provides a means for attendants to conference between themselves, a current call, and the last call that they placed on hold.

Overflow Button

When an attendant presses this button, calls that normally ring at his or her telephone also ring at an overflow attendant's telephone as well.

Queue Button

When multiple calls are ringing at an attendant station or are on hold there, the system places them in a queue. The attendant can use this button to determine how many calls are queued and awaiting service.

Serial Call Button

When a caller wishes to speak to more than one person or department, the attendant uses this button to place the caller in a serial mode of multiple transfers to every desired party. In the serial mode, the system automatically transfers the caller to another party as soon as a present party hangs up (up to three stations can be part of a serial transfer). The system places the caller in the serial mode as soon as the attendant hangs up.

Test/Busy Button

This button provides the attendant a means to test the status of specific lines. Attendants can use this button to determine whether individual lines are idle, busy, on hold, or out of service.

Also refer to the discussions titled *Answer Button, Lock Button, Release Button, Split Button, and Silent Mode Button* and to the discussion titled *Programmable Button Flexibility*.

Attendant Position, PC

The Total Control PC attendant position is a computerized attendant operating station that consists of an IBM-compatible personal computer, a proprietary interface circuit board (factory-installed in one of the computer's expansion slots), a customized keyboard that includes a handset cradle, a telephone handset, a program diskette, and all necessary cables for connecting the equipment to the DXP. The DXP can handle a maximum of four PC Attendants.

Among the many features that are available to the PC attendant is a feature that allows him or her to change the class of service of an individual station. This feature allows an attendant to control the calling parameters of a station (such as how much or little toll restriction to allow) at any time.

The installer can program function keys F1–F12 on the PC attendant keyboard with features that are in addition to the fixed features that these keys provide. To access the additional features, the attendant must press and hold the CONTROL key while pressing the desired function key on the keyboard.

Authorization Code

Authorization codes have a "walking class of service" option. Walking class of service provides system users the mobility to use their class of service (COS) features, prime line assignments, and exception numbers on any telephone in the system instead of being limited by what is available to the particular telephone they happen to be using. Authorization codes are associated with personal intercom numbers as is COS, prime markings, and exception numbers. Therefore, when a user enters his or her authorization code at any system telephone, the code alerts the system as to what features to make available to the user. The user can use the telephone for anything allowed by his or her personal intercom number; however, a user cannot disturb the last number redial stored there by the normal user. Once a user accesses his or her telephone features, those features remain in effect until any idle time exceeds the authorization code time-out period. A telephone user activates walking class of service by pressing ITCM and then dialing #08 followed by an authorization code. Also refer to the discussion titled *Lock Button*.

Automatic Dialing

Refer to the discussion titled *Station Speed Dial***.**

Automatic Hold—Intercom To Intercom/Line

If a user selects a second intercom number during the time that he or she is already active on the first intercom number, this feature causes the first intercom number call to be automatically placed on hold. This feature allows a user to move from intercom call to intercom call without having to press the HOLD button to place any current calls on hold. The programmer must enable this feature for it to be available.

Automatic Hold—Line To Intercom

If a telephone user selects an intercom number while a line call is active, this feature causes the system to automatically place the line call on hold . This is a fixed system feature and is always available.

Automatic Hold—Line To Line

If a user selects a second line during the time that he or she is already active on a line, this feature causes the system to automatically place the first line call on hold. The feature allows a user to move from line call to line call without pressing the HOLD button. The programmer must enable this feature for it to be available.

Automatic Number Identification (ANI)

Automatic Number Identification (ANI) is a T1 service feature for both E&M and DID lines. Long distance common carriers offer ANI as a feature to dial 800 and dial 900 lines. The ANI feature provides information to an internal telephone system that identifies the telephone number of the calling party. Businesses served by a dial 800 or dial 900 service allow any available user to answer the calls and have their internal telephone system process the ANI information to identify the caller's telephone number. The common carrier supplies ANI information as DTMF digits. When the ANI feature is combined with the Dialed Number Identification Service (DNIS) feature, the common carrier also delimits the DNIS information from the ANI information with an asterisk (✻) tone so that the DXP can process each portion properly.

Automatic Pause Insertion

When the system stores a dialed number for later redial, it automatically stores a pause whenever the user waits between digits for at least two seconds while dialing the number. The system inserts the automatic pause in the stored number sequence at the point where the manual pause in dialing occurred. The actual time length of the inserted pause is programmable.

Automatic Privacy

The programmer can make a line private or non-private. In the private mode, a station has exclusive use of the line during a call. No other station can access that line unless the original user includes it through the use of the add-on conference feature. In the non-private mode, any stations with that line appearance can gain access at the same time (sometimes known as common line pickup). Users may add up to five parties into one conversation. Also see the discussions titled: *Conferencing —Multiline and Privacy Release.*

Automatic Redial

With this feature, the system automatically redials a busy or unanswered outside call. Once the user activates automatic redial, the station selects the line, automatically dials the number, and waits for a response. (It dials and then waits 30 seconds for an answer.) If the called station does not answer, the redialing station disconnects, waits one minute, and then repeats the sequence. The station will repeat this procedure for approximately 10 minutes. The feature cycle is timed and does not have busy and ring-no-answer detection circuitry. Because of this, if the redialing user is operating handsfree when the called party answers, he or she must take the handset off-hook to prevent being cut off by the timing cycle. The station users must program an Auto Redial button at one of the designated programmable button locations on their telephones before they can use it.

Automatic Reports

This feature makes the system automatically generate selected station message detail accounting and call costing reports for printing on a daily or weekly basis. The programmer sets the time that the report is to be printed, sets the type of report to be printed, and dictates whether the call records are to be erased from the system memory after they have been printed.

Automatic Route Selection

Automatic Route Selection (ARS) allows the system to automatically select the least costly line group available to a station to route a call. The system modifies the dialed number, if needed, to match the selected line group. Additionally, ARS provides the costing information for the dialed call that is reported by the station message detail accounting feature. ARS makes routing decisions (which lines to route a call over, if and how to modify a number, and costing information) based entirely upon the programming of the system.

When the ARS feature is active, the user selects ARS by dialing 9. Because direct line selection by the user bypasses the ARS route selection feature, the programmer normally does not give stations direct line appearance when ARS is part of the system operation.

The ARS feature can operate with the toll restriction feature or independently from it; however, both features use the same entry table for programming. The programmer enables or disables automatic route selection on a system-wide basis. A defaulted system has ARS disabled.

The programmer must program a number and the proper routing information before the system can perform ARS on that number when it is dialed. The programmer generally arranges routing from the least costly routing method to the most costly routing method. The costliness of the route is determined by the line group over which the call is routed.

If a station does not have access, because of programmed restrictions, to a route that the ARS selects for it, the system denies the dialing and causes an error tone to sound at the station. If the station does have access, ARS routes calls from that station based on the routing information. If the call can not be made on the line group first selected by the routing, ARS will try the next route. Once again the route access is tested. This process is repeated, up to a maximum of six times. Each route is programmed from least to most costly. The more costly the route, the higher the access level needed to access it and the greater the chance that the station will be denied access. If ARS selects a more costly route because the least costly one is busy, a station user receives a warning tone when a call is attempted. Since this tone indicates that a more expensive line group was chosen by the system, the station user should hang up and try again later. This warning tone feature is enabled through programming.

Before automatic route selection can operate efficiently in a cost saving manner, the programmer must group similar lines together into line groups.

Each route in every route table contains costing information. The costing information includes two programmable tiers of costing and a programmable surcharge amount. Even if a call is not routed through ARS, (if the station user selects the line), the system still accesses this costing information to cost the call.

The programmer can arrange the automatic route selection feature so that it modifies the dialed number by adding or deleting digits until the number better fits the dialing needs of the selected route. Doing this results in situations such as the following example:
Assume a station user dials 12025551212 (Washington D.C. area), and further assume that the system has an FX line to the Washington D.C. area and ARS will route the call over it. ARS will delete the 1202 prefix and only dial 5551212 because the FX line does not require the prefix numbers to complete the call. Field maximum: 20 digits.

You can program the system for any one of three different dial tones that you will hear whenever you enter the ARS access code. The ARS dial tone choices are:

— Dial Tone 1 - steady intercom dial tone (dual tones of 480 Hz + 620 Hz),

— Dial Tone 2 - same as dial tone 1 only preceded by three short tones (200 ms on, 200 ms off),

— Dial Tone 3 - steady similated central office ring back tone (dual tones of 440 Hz + 480 Hz).

Restrict ARS Hookflash (Automatic Route Selection, Hookflash Restriction)

This feature enhances ARS response to hookflash action on an outside line when that action is followed by dialed digits. With the feature enabled, the system delays response to a hookswitch flash until after the ARS feature verifies as valid all subsequent dialed digits. With the feature disabled, the system sends the hookflash over the line without waiting for the ARS feature to verify the validity of subsequent dialed digits. This station class of service feature is applicable only when the ARS feature is active.

Automatic Route Selection For Speed Dials

The programmer can arrange for the system to route the system speed dial and any personal speed dial numbers that the user has programmed through the system's automatic route selection feature (ARS).

Automatic Station Relocation

The system will automatically recognize a particular station should someone relocate it to a different station port. After being installed at a new port location, a relocated station will provide the same class of service parameters and station features that it provided at its original port location. Also, the relocated station will respond to the same personal intercom number that it responded to at its original port location. A relocated station prompts the user to take action to either accept its original programming or accept the programming at the new port. If the user takes no action, the station assumes the parameters and personal intercom number that is determined by a system programming procedure. Consider these following points when you enable station relocation:

- If someone does a station relocation, the programmer must save the database programming to make the relocation permanent.
- This relocation feature only applies to digital telephones.
- Users must ensure that the vacated port remains unused until they complete a relocation.
- If someone connects a telephone to the vacated port before users complete a relocation, the relocated telephone will not retain its original programming.
- When the user accept the original programming for the new port, the vacated port assumes the programming currently assigned to the new port (that is, a parameter exchange takes place between the vacated port and the new port).
- If a DSS/BLF console was assigned to the telephone at its original location, the console assignment follows the telephone to the new location even though the console is no longer located physically near the telephone. If the user relocates the console, the system programmer must reprogram the new port for console use.

The relocation feature also applies to relocated digital telephone boards, however, the installer must ensure that the vacated port remains unused until the relocation is complete. All stations connected to the relocated circuit board show the relocation prompt.

Auxiliary Equipment Interface (Busy Lead Detection)

One line port on every loop start line board will detect current flow on the line ahead of the common equipment. When an external device, such as a modem or fax, is connected to this line and is activated, current flow over the line occurs. When the port detects the current flow, the system causes a busy indication for this line to appear at every system telephone that has its appearance. Normally, the user cannot interrupt an external device by pressing the line button or by dialing a line group code; however, if the line is programmed to be non-private, a user can interrupt the device.

Auxiliary Station Ringer Interface

The central processor unit circuit board includes four dry-contact relay actuations. They may be used for the following:

- Programmable Station Ringer Interface
- Paging Enable
- Door Relay Lock/Unlock
- Zone Night Answer

The relay contacts for the station ringer interface follows the ring pattern of a ringing line or telephone. These relay contacts close during ringing and open between rings and may be used to control an external signaling device. The relay contacts for the paging enable and door relay are closed while the activating station is off-hook and may be used to provide a path for an enabling signal where needed. Contacts on relay 1 is normally closed when idle and contacts on relays 2, 3, and 4 are normally open when idle.

Also refer to the discussions titled *Common Audible Ringer Interface, External Paging Interface, Flexible Ringing Assignments, Line Answer From Any Station, and Night Transfer (Of Ringing)*.

B

Background Music (Two Selections)

If the system includes an external music source, telephone users can turn background music on and off at their stations. The system uses two dedicated audio ports to interface the music sources, one for background music through the station speakers and the other for music on hold for both lines and intercom numbers. Therefore, the background music can be different from the music provided to held calls if the system installer connects two different sources to the system. When the two different choices are available, station users can dial a code to choose either source for their background music.

Also refer to the discussions titled *Music Interface* and *Music On Hold*.

Battery Back-Up (Chassis, Cable, and Batteries)

Battery back-up assemblies that include chassis, cable, and battery are available as optional kits (through normal distribution from Comdial). The battery back-up assembly connects directly to the battery interface connector on the system main power supply.

Battery Backup Interface

Attach a Comdial-provided optional battery backup kit to the DXP digital communications system for full uninterruptable system power in case of an AC power loss. The switching and trickle charge circuitry are in the common equipment power supply assembly, but batteries, chassis, and cable are packaged as a separate option. When the installer plugs the system into an active AC power source, the common equipment power supply will constantly charge the attached batteries with a trickle current. Built-in circuitry automatically switches to battery power when AC power is lost. With batteries at full charge, a fully loaded system (without expansion cabinets) will remain fully functional for a minimum of one hour without AC power.

If additional time is required, the backup time can be increased by adding additional batteries.

Block Programming

A programmer can assign the programmed features of a particular line or station, to other lines or stations. He or she can also assign a particular arrangement of button functions (mapped buttons) of one telephone to a quantity of other telephones. This feature eliminates the need to individually program every station class of service, line and/or button function.

Busy Button Inquiry

This feature provides the user with a means to identify both a station that is busy on a line and the line the station is busy on as well. The system presents the identified line or station information on the user's telephone display for 10 seconds after he or she requests that information. If the system installer has not given the user's telephone this feature, the system presents busy information to the display without identifying the line or station involved.

Button Mapping

Refer to the discussion titled, *Full Button Programmability Of Features, Programmable Button Flexibility, and Square / Non Square Configuration*.

Button Query

The button query feature allows users to display the function of programmable buttons on LCD telephones.

C

Call Announce With Handsfree Answerback

The internal speaker at each full–featured multiline telephone provides call-announce capability over the personal intercom number. Users can call announce between all telephone types except between an analog monitor telephone and digital telephones. When a user makes a call-announce intercom call to the personal intercom number of another telephone, the user of that telephone can make a handsfree response to the call. If the personal intercom number is forwarded or is in a hunt group, the intercom call will appear as a tone signaled intercom call at the telephone to which the calls are forwarded. A tone burst, programmable by the installer, precedes the call announce.

Call Announce Beeps (Call Announce Tone Bursts)

Installers can set the number of call announce tone bursts for each station in the system to be a value of from one to five .

Call Costing And Station Message Detail Accounting Reports

The system provides built-in, estimated costing of all calls. It also provides station message detail accounting (SMDA) reports of all calls, and it displays call costs on LCD speakerphones. Call costing, in general, provides a means of establishing costs to be applied to outside calls made from system telephones. Call costing computes charges for a call after it is completed but does not restrict dialing as toll restriction does. Call costs are based on a two-tier time rate and include a line surcharge cost. The programmer can make allowances for call set-up and minimum call duration using the answer time and dial time parameters. The system determines call costing through the use of the toll restriction and automatic route selection (ARS) features; however, these features need not be active for costing to work. Call costing is based on programmed estimates that best fit the particular area of the country the system is installed in.

Caller ID

DXP caller ID provides relevant caller information (caller's name and number, for example) to any called LCD stations. The installer can program any C.O. line as a caller ID line. The caller ID information is also reflected in the SMDA printout. The DXP Caller ID feature package requires the use of a CID08 unit—hardware designed to support the Bell 202 Caller ID signal transmitted by the central office. The CID08 supports up to 8 CO lines (you can install up to 8 CID08 units), for a total of 64 caller ID lines.

Caller ID RNA—Ring–No–Answer

If a station with assigned caller ID lines receives a call but does not answer, the system will automatically archive the caller ID information. The installer can program any station or group of stations to receive Caller ID RNA information. Upon reviewing a Caller ID RNA record, the user can automatically redial that number by pressing the SAVE button. When the caller ID information goes to more than one telephone, the system will also display the last station user that viewed that record, thus preventing multiple call backs. Caller ID RNA is a programmable feature.

Call Forward—All Or Personal

Station users can forward the calls that normally ring at their telephones to another telephone for answering. They can forward just their prime line and intercom calls or forward every call that rings at their station. If users forward calls while the attendant has enabled the night transfer of ringing mode, the night mode ringing assignments at their stations are forwarded. There are multiple levels of forwarding. Station A can forward to station B, then station B can forward to station C, thus making calls to station A forward all the way to station C. For each internal call received while call forward is enabled, the forwarding telephone sounds a ring reminder (short tone burst) to remind the users that their calls are being forwarded.

The programmer can assign a call forward button to individual telephones. If a telephone has a call forward button available at a programmable button location that includes an associated light, the light turns on when the user presses the button.

If a telephone has an LCD display, it will show a call forward message along with the extension number or name of the station receiving the forwarded calls.

Also see the discussions titled *Call Forward— Busy Or Ring No-Answer, Call Forward—Manual, and Default Busy Ring No-Answer Call Forward.*

Call Forward—Busy Or Ring No-Answer, All Or Personal

Station users can forward the calls that normally ring at their telephones to another telephone for answering. They can forward just their prime line and intercom calls or forward every call that rings at their telephone. Users can control whether the calls forward immediately or after a preprogrammed number of rings (this is true of busy calls as well, which ring in a subdued manner) that is set by the programmer. When the telephone is set to ring several times before forwarding, the user has a chance to end the current call before the incoming call is forwarded. Certain conditions must exist before this enhancement will allow the call to a busy station to subdue-ring before forwarding. The called station must have an idle intercom available and this intercom number must be part of the intercom hunt list that the programmer arranged for the station, or the call to a busy station will forward automatically. The number of group intercoms in a station's intercom hunt list determines the number of calls that can subdue ring on a busy station. After the system reaches that maximum number, any additional calls immediately follow the station's forwarding assignment.

When a busy station receives a call on a line for which it has an appearance, the call will forward immediately. If the station does not have a line appearance but does have an idle intercom in its hunt list, the call will subdue–ring at the idle intercom for the programmed number of rings before it forwards. When a busy station receives an intercom call or a transferred call and it has an idle intercom in its hunt list, the call will subdue ring at the idle intercom for the programmed number of rings before it forwards.

The programmer must enable the call forwarding enhancement as a separate programming choice in addition to class of service programming. Once the feature is enabled, it will enhance both the default call forward scheme and the call forward scheme that the users set up for themselves.

Also see the discussions titled *Call Forward - All Or Personal, and Default Busy Ring No-Answer Call Forward.*

Call Forward—Immediate

The installer can map a call forward button on the user's telephone that will allow the user to forward calls even if he or she is not busy. After a user determines where to forward a call and activates the call forward button, the system will immediately forward the call once the line rings.

Call Forward, Recall

If the site includes ExecuMail equipment and the programmer has arranged for the ExecuMail to provide release transfer, she or he should also arrange for the ExecuMail station to have this call forward, recall feature. Also see the discussion titled *Call Forward–Busy or Ring No-Answer, All Or Personal.*

Call Park

The system can hold nine calls in park zones (also referred to as orbits) where they are retrievable by all users in the system.

Those calls that users can park include intercom calls, outside calls, and conference calls. Users park calls in predefined zones and then retrieve them by dialing an intercom feature code or by pressing a preprogrammed call park button. Call park, when used with paging features, allows a user to direct calls to roving personnel by first parking a call in an orbit and then paging the personal to tell them which orbit holds the call. When a user retrieve a call from park orbit, the system places the call on the user selected intercom. If the station has several intercoms arranged in a hunt list, the system always chooses the intercom that the user selected.

Also see the discussion titled *Call Park Recall.*

Call Park Recall

If a call remains unanswered after the park recall time has ended, the system returns the call to the parking station where it rings. If that telephone includes an LCD display, a message appears on it that shows the park orbit number of the returning call as well as the line number.

The system programmer sets the call park recall times. Prior to software release 8C, he or she could choose a minimum time of one minute; however, beginning with software release 8C, the minimum call park recall time that the programmer can choose is 30 seconds.

Also refer to the paragraph titled *Call Park.*

Call Pick-Up Directed

A station user can dial a code and the intercom number of a ringing station to answer the call.

Call Pick-Up Group

If a call rings to any station in a preprogrammed pick-up group, and a second user in the group wishes to answer the call, the second user can dial the group pick up code to answer the call. Up to 16 different groups can exist with any number of stations in a group. The system provides group overlap by allowing stations to be in more than one group at the same time thus enabling them to pick up calls for stations in each group. The programmer places the stations in their logical answering groups.

Call Pick-Up System

If a call rings at any station in the system, certain other station users, such as the attendant station, can pick up that call. That station user must dial the appropriate pick up code to answer the call, and the station must be programmed to pick up the call. The programmer places all telephones in the same pick-up group to enable this feature.

Call Transfer—Screened

Screened call transfer allows users to first announce and then transfer both line and intercom calls from one station to another station or group in one of two ways. If both stations have access to the line or intercom number, the user makes a common line pickup transfer. If the other station does not have access to the incoming line, the user makes a transfer using the system transfer feature. The user uses the TRANS/CONF button to effect the call transfer. Also refer to the discussion titled *Call Transfer—Unscreened with Automatic Camp-On, and Hot Transfer.*

Call Transfer —Unscreened With Automatic Camp-On

Unscreened call transfer allows users to transfer both line and intercom calls from one station to another station or group without first announcing them. The unscreened transferred call appears at the other station where it will ring if that station is idle or automatically camp-on and await an answer if that station is busy. The call automatically rings back to the transferring station after a programmed recall period. There is no limit as to how many calls that can be camped onto another station. A transferred call will ring if the called intercom number is idle. If the handset is off-hook, the ringing is subdued.

Call Waiting Tone

A user can send a call waiting tone to signal to a busy station that he or she wishes that station to contact them. They do this by dialing a special code when they encounter a busy signal. The call waiting tone sounds at the busy station and reoccurs until the calling party hangs up. The frequency of the call waiting tone is preprogrammed by the programmer.

Camp-On With Automatic Call Back

After calling another station and encountering a busy signal or a ring with no answer, a user can camp on to that station, hang up, and wait to be called back by the system when that station becomes idle or when the user returns. Likewise, a user can camp-on to a busy line, hang up, and wait to be called back when it becomes idle.

When the busy station becomes idle, the system rings the originating station and starts a timer. The user of the originating station must take it off hook as soon as it rings and as soon as he or she does so, the camped-on telephone rings.

When the user of the ring no-answer station uses it for any call activity, the system detects this activity as a sign that the user has returned. As soon as that call activity is finished, the system rings the station that originated the camp-on and starts a timer. The user of the originating station must take it off hook, and as soon as he or she does so, the camped-on telephone rings.

When the busy line becomes idle, the system rings the originating station and starts a timer. The user of the originating station must take it off hook before a preprogrammed time out occurs. As soon as he or she does so, the camped-on line returns dial tone to the originating station. If the originating user does not take his or her station off– hook before the time-out period elapses, the system cancels the camp-on. If, for some reason, the system cannot ring the camped-on facility after the user takes the originating station off hook, he or she hears busy tone and may camp-on again.

Camp–On—Call Waiting

If a user makes a call to a busy telephone, he or she can send a call waiting tone to the busy telephone and wait on line for an answer. As soon as the called telephone returns to idle, it will ring with the camped on call.

Also refer to the discussion titled *Call Waiting Tone.*

Camp–On—No Answer

Refer to the discussion titled *Camp–On With Automatic Call Back.*

Clear Major Alarm Ring

Major alarm rings occur whenever a number of faults exceed a programmed threshold. You can use a telephone station to clear a major alarm ring by pressing the INTERCOM button and then dialing a feature code (default code is #09). However, the telephone station must have a class of service (COS) assigned to it that has this feature enabled. The installer or programmer enables this feature through COS programming.

Central Message Desk

The programmer can designate one station as the central message desk and arrange for it to have exclusive message waiting control. A central message desk user takes messages for other system users, controls the message waiting light at their telephones, and delivers the messages upon request.

Also refer to the discussion titled *Message Waiting.*

Central Processor Switched Data Port Configuration

The CPU board provides a dual in-line pin (DIP) switch that enhances installer convenience in setting up data communications between the DXP and an external data device. It is possible to mismatch the data port configurations between the DXP and the external device in a manner that prevents data communications from occurring. The DIP switches provide a hardware way of setting the data configuration to a known set of parameters without the need for reprogramming the system. With the switch set to ON, the DXP provides the following data parameters:

Parameter	RS232 1	RS232 2
Baud Rate In	9600	300
Baud Rate Out	9600	300
Data Bits	8	7
Stop Bits	1	2
Parity Bits	None	None
Flow Control	None	None

Common Audible Ringer Interface

Relay connections that provide dry-contact closure whenever ringing occurs are available on the central processor unit circuit board. The relay closure tracks the ringing pattern of the applied ring signal and is typically used to control an external ringer device. The installer can program the particular ringing assignment that is tracked, and the ringing assignment can be any one of those that are provided by the flexible ringing assignment feature.

Also refer to the discussions titled *Auxiliary Ringer Interface, External Paging Interface, Flexible Ringing Assignments, Line Answer From Any Station, and Night Transfer (Of Ringing).*

Communications Card Support

The communications card provides serial data ports for interfacing such items as open architecture interface applications, PC attendant positions, and the SMDA data printer.

Install communications cards on the services board, the expansion cabinet interface boards, and the main cabinet's auxiliary board. Each of these boards will accept two communications cards in its lower two slots.

The DXP supports a maximum of 18 serial data ports. Two of these ports are the dedicated ports provided by the CPU board while communications cards provide the remaining 16 undedicated ports.

Conferencing - Multiline

This feature allows one station to access other stations or lines at the same time resulting in a conference arrangement. Users press the TRANS/CONF button to establish conferencing.

A station user can make conference calls that encompass up to five parties, including the originating station, in any combination of lines and system stations. For example, a user can conference his or her telephone with three lines and one other station.

After establishing a conference between his or her station and two external parties, the user can drop out of the conference by dialing a special code. The conference between the two outside parties continues in an unsupervised condition. During unsupervised conferences, a line-to-line connection exists through the system.

The programmer can use the line-to-line connect duration feature to set the length of time that the system allows an unsupervised conference to continue. Prior to software release 8C the maximum time that he or she can choose is 30 minutes; however, beginning at software release 8C, the programmer can choose *never* as a programming option. System planners should be careful when choosing the never recall option for systems that have loop start line without disconnect supervision. Both distant parties can leave an unsupervised conference thus leaving the line unused yet still active. This line will remain active until the person that set the conference rejoins it to disconnect the line.

Conference Advisory Tone

Beginning with software release 9A, the conference advisory tone feature allows programmers to configure the system to provide an audible tone whenever more than two parties are connected in a conference call. They may select this tone as either a one time tone or as a periodic reoccurring tone. If they choose a reoccurring tone, they must select the time interval between the reoccurring tones.

Console Support

The DXP supports the operation of a DSS/BLF console. The system installer must use a station port to install each DSS/BLF console; however, the programmer can assign up to four DSS/BLF consoles to support the operation of one system station. When assigned to a station, a DSS/BLF console provides additional programmable buttons that the user can program as direct station select (DSS) buttons with associated busy lamp field (BLF) lights and as speed dial buttons (the console, however, does not support second-level speed dialing). The programmer can also assign both outside lines and intercom numbers to console buttons when necessary. The station with which the console is assigned to work does not have to be a paired station port.

Consoleless Operation

The system can operate with or without the use of an attendant console.

Consultation Hold

When the station user presses the TRANS/CONF button while on a call, the call is placed on consultation hold and dial tone is returned to the station. The user may then make another intercom or line call. After speaking with this "consulted" party, the station user may do any of the following: (1) return to the held call by selecting the line or intercom number for the held party, (2) effect a conference by pressing the TRANS/CONF button (putting the held call, the consulted party and the station user in conference), (3) hang up and effect a transfer of the held party to the consulted party. If the user encounters a busy or a ring no-answer, he or she may press the TAP button to return to the held party.

Transfer considerations:

- The system default denies line-to-line transfers.
- To make an unscreened or blind transfer, press the TRANS/CONF button, dial the desired intercom number, and hang up.

Copy Model

Refer to the discussion titled *Block Programming.*

Database Program Storage

The Save/Restore Database feature saves a database externally from the DXP and restores it after the system programmer turns the DXP off and upgrades the operating system software. This feature employs a personal computer with an XMODEM communications program to store the database on a magnetic diskette and reload it from the diskette after software upgrades. The saved and reloaded database includes all of the following data: system information, station parameters, line parameters, toll restriction and automatic route selection parameters, and system speed dial numbers but it does not include the SMDA/SMDR records. The system programmer must make a printout of all stored SMDA/SMDR records before he or she performs the database storage because this save/restore feature does not record them and they will be lost. The Software Upgrade feature saves a database internally within the memory (requires expanded RAM card—DXRAM–Exp 68K) of the DXP equipment and restore that database after the system programmer has turned the DXP off and upgraded the operating system software. Saving the database in this manner eliminates the need for a personal computer with an XMODEM communications program to insure translation of the database between software upgrades.
NOTE: It is a good practice to save the database to a PC as a general back–up of your DXP programming.

Database Programming (From Main Station)

The system administrator can use a system telephone to reprogram certain feature parameters away from the values set by the installer using the computer-based VMMI. Included among the features that the system administrator can program are the ability to assign prime line, prime group, or prime intercom to the stations, and the ability to assign day and night toll restriction exception numbers to the stations.

Database Programming

System programmers employing the visual man machine interface (VMMI) program running on a DOS-based personal computer can customize the DXP system parameters and change the system data base. The VMMI program causes the system to down load the existing database to the PC's memory where the installer can make additions and changes to database. While the installer is reprograming the database, the system allows users to continue to use their telephones but prevents them from making changes that affect the database's structure. As the installer makes the changes to the database, the VMMI program sends these changes back to the DXP memory.

Day One And Day Two Ringing

Refer to the discussion titled *Flexible Ringing Assignments*.

Day Restriction Level

Refer to the Discussion titled *Toll Restrictions.*

Default Busy/Ring No-Answer Call Forward

The programmer can arrange for the system to automatically forward any calls that ring at busy telephones or any calls that ring and are not answered after a preprogrammed number of rings. The programmer chooses the station to receive those calls forwarded with this feature on a station-by-station basis; he or she can also program the number of rings (0-6) the system requires until it rolls the call to the forwarding station. The system defaults to four rings, three rings for voice mail ports. Users do not select this operating feature since it is fully automatic; however, user-enabled call forwarding overrides this default busy ring no-answer call forwarding.

Also see the discussions titled *Call Forward - All Or Personal; and Call Forward-Busy Ring No-Answer, All Or Personal*.

Default Functional Programming

At initial power up of the system, the system operating features consist of a specific group of conditions (default conditions). These default conditions provide a completely operational system for normal use. A system installer can leave the system in a defaulted state or reprogram it as desired. After reprogramming, a programmer can restore default conditions to the system at any time they are needed as follows:

- When a master clear is programmed, the entire system is restored to the basic default start-up operating mode. This action erases *all* customized program settings.
- When a system default is programmed, all system parameters and timing are reset to the basic start-up settings. *Plus*, system-wide customized data such as LCD messages and system speed dial numbers are erased.
- When line default is programmed, all lines are set to the basic operating parameters. Any lines that are now programmed for rotary dial are reset as tone dial.
- When station COS default is programmed, the station operating features are set to the basic operating mode.
- When button mapping default is programmed, each button at every telephone connected to the system is reset to the basic settings for that particular model of telephone. This means that all unique button functions are erased.
- When the table defaults are programmed, all customized data that the programmer has entered in any tables such as SOHVA groups and toll restriction tables are erased. See also—*Master Clearing The System.*

Delayed Ringing

Ringing assignments are programmable. A programmer can program a station to provide delayed ringing on some lines while providing direct ringing on other lines.

Diagnostics (Limited)

The installer can use this feature to perform maintenance routines and diagnose certain system malfunctions.

Dial 0 For System Attendant

A user can signal the system attendant station (station 101 at default or any other station set by programming) by dialing the digit 0 on their personal or group intercom number.

Dial Pulse Interdigit Time

You can set the interdigit time between dial pulses when the system pulse–dials a number over a line. The DXP defaults this time to 200 milliseconds and provides a range of timing values in 100 millisecond intervals between 100 milliseconds and one second.

Dial Pulse Rate—Make / Break Ratio

You can set the line make / break ratio for rotary dial signaling in a more flexible manner. You can program the make and break times independently in one millisecond increments to any time from one to 99 milliseconds.

Dialed Number Identification Service (DNIS)

The DNIS feature allows the DXP to read an inband DTMF digit string sent by a common carrier. It uses this information to identify the telephone number the caller dialed and appropriately route the call. DNIS is a service that long distance carriers make available for dial 800 and dial 900 number subscribers on trunks that use E&M signalling over a T1 network. Also see the discussion titled *Automatic Number Identification (ANI)*.

Digital Wireless Telephone Support

The DXP supports the operation of the Scout 900MX digital wireless telephone. The Scout 900MX is a full-featured proprietary multiline telephone consisting of a wireless handset that lets the user roam about and still make and receive telephone calls.

Direct-in Lines (DIL)

The direct-in lines (DIL) feature provides a line appearance at a dedicated button on one or more multiline telephones. The programmer can assign a DIL to a proprietary single-line telephone where it provides one-way (either incoming or outgoing) or two-way operation depending upon further programming action.

Direct Inward Dialing (DID)

The DID line board allows incoming CO calls to reach intercom extensions by direct dialing with no attendant assistance. Since DID lines are incoming only, their direct appearance in limited to attendant stations where their status indication may be useful. The CO assigns the DID numbers and the system translates them into intercom numbers for station ringing.

DID Hunting

When a DID call rings at a station that the programmer has disabled though programming action, the system routes the call through the disabled station's hunt list until it locates a group intercom for the call to ring. Should all group intercoms be busy or should no one answer the call in a programmed number of rings, the system then routes the call along the station's call forwarding arrangement. With a hunt list containing up to eight assigned group intercoms and access to each group intercom available to several system stations, many users have an opportunity to service a DID caller. Coupling this flexibility with the station's call forwarding ability, provides many chances for system users to service DID calls. A programmer could program a hunt list and a call forwarding scheme to an unassigned station and provide a designated DID termination and routing center. There would be no need to connect a telephone to the station port to use the feature in this manner. The programmer could arrange several DID termination centers to service different DID numbers. Each DID number could represent different calling categories, and ring at different blocks of system stations (see Multipurpose Line Board for more information).

Direct Line Access By Station

Through program assignment, the system gives certain stations direct access to lines. The programmer must map line buttons for use at these stations. The users then press the line buttons to select lines for use.

Direct Line Group Selection

This feature allows the programmer to put lines into line groups. A line group appears to the station user as a single button. The system supports a maximum of 16 line groups with a line group containing any number of lines; however, all lines in a group must be the same type. A multiline telephone can have a line group button for each line group. A single-line proprietary telephone is either dedicated to a specific line group, or it's user may dial a code to access a line group.

When a user presses an idle line group button or dials a line group access code, the system scans the lines in that group and picks the first available line in a reverse hunt group. The indicator associated with the line group button on multiline telephones is idle if at least one line in the group is idle.

Direct Inward System Access (DISA)

DISA allows outside callers to directly call a station or access certain internal system features, including all line groups and ARS. The system allows up to eight DISA lines to be active at the same time. To prevent fraudulent access and unauthorized use, the caller must use an authorization code and system access code to gain access to outside lines as well as many of the advanced telephone features. The authorization and access codes are from one to six digits (including pauses). You can use any of the digits zero through nine.

The system denies access, and routes a DISA call to a pre-programmed device such as a station telephone, or proprietary voice mail, under the conditions listed below:

a caller dialing an invalid authorization code,

a caller dialing restricted or invalid features,

Comdial has taken reasonable steps in the design of all product features, including DISA, which protect against unauthorized or fraudulent access to, or use of, a system, or which protect against unauthorized, fraudulent or unaccounted-for access to, or use of, long distance lines. However, no system is entirely invulnerable or immune from unauthorized or fraudulent access or use, or unaccounted-for access or use, and therefore Comdial disclaims any and all liability, and makes no warranty, express or implied, relating to unauthorized or fraudulent access or use, or unaccounted-for access or use.

NOTE: DISA is not recommended for use on loop start lines without disconnect supervision. While DISA will function, Comdial will not be liable for its performance under any condition where disconnect supervision is not provided.

NOTE: Callers that use DISA to access a trunk group and place calls (trunk to trunk calling) may experience low audio levels on their calls due to the normal line resistance of CO lines. A low audio level is usually only noticeable on long line loops. If signal loss is a problem at a particular site, the installer may need to add a line amplifier (repeater) in the DISA line.

In regard to the above note, software release 8C adds +3dB of gain to the DISA lines as a default setting, and provides a means for the programmer to disable this gain if necessary. The software enhancement also provides a means by which DISA callers can preselect the gain on a DISA line before they select the line for use. They can dial a code to select either 0dB, +3dB, or +6dB of gain.

It is important to note that uncompensated line–to–line DISA connections often exhibit low audio levels due to double loop copper losses. While adding gain to these connections will usually improve audio signal levels, the added gain may also result in circuit instability in some connections. This instability presents itself as a singing sound that can interfere with dialing or voice communications. If callers experience dialing problems or hear a *singing* sound in their calls, they should select a lower gain setting for use.

Disconnect Supervision

When the programmer enables this feature for a line, the system detects any break in loop current anytime during a call and disconnects the line. Also refer to the discussion titled, Abandoned Hold Release.

Discriminating Ringing

The system provides two types of ringing to give an audible distinction between internal and external calls. Internal calls sound two quick bursts every four seconds and external calls sound one long burst every four seconds, except when synchronized ringing is enabled. When synchronized ringing is enabled, the central office ringing pattern is tracked on external calls. Incoming calls transferred by an attendant always ring as an external call.

Do Not Disturb (DND)

Users can set any multiline telephone to a do not disturb mode (DND) using the designated programmable button. The associated indicator turns on as an indication of active DND an appropriate message appears in the display of LCD speakerphones. Under the DND condition, an outside call forwards to another station or to the attendant according to the call forwarding feature. An intercom number call will not ring a DND station and the system sends a fast busy signal to the caller to distinguish from a standard busy line. No paging announcements are received on the DND station. Even though a station is in the DND mode, the user can make out-going calls and access other features.

You can set any multiline telephone to a do not disturb mode using the designated programmable button. The associated indicator turns on as an indication of active DND an appropriate message appears in the display of LCD speakerphones. Under the DND condition, an outside call forwards to another station or to the attendant according to the call forwarding feature. An intercom number call doesn't ring a DND station and the system sends a fast busy signal to the caller to distinguish the DND condition from a standard busy line. No paging announcements are received on the DND station. Even though a station is in the DND mode, you can still make outgoing calls and access other features.

You can enable or disable this feature on an industry-standard telephone by dialing the feature code (default is #01).

Do Not Disturb (DND) Inhibit

The programmer can inhibit DND on a station class of service basis.

Do Not Disturb (DND) Override

The programmer can provide stations with a Do Not Disturb (DND) override capability that will allow them to call a station that is set in the DND mode. The programmer must also enable the executive override feature for the DND override feature to function. Refer to the discussions titled: *Do Not Disturb and Executive Override*.

DSS/BLF Console Support

The DXP system supports the use of both digital and analog proprietary DSS/BLF consoles. The installer can place a console at any station port and use database programming to identify it as a console port. The installer then uses database programming to enable the console to be a companion to a telephone that he or she has installed at any other station port. The system supports the use of up to four consoles for each telephone, and there is no limit to the maximum number of consoles that it will support.

The DSS/BLF console provides a one-button direct station selection (DSS) intercom and an associated busy lamp field (BLF) additional autodial capability to the telephone user.

DSS Status Button

When the programmer assigns the personal intercom number of one telephone to appear at a button on another telephone, the button and its associated light provide a direct station select (DSS) busy lamp field (BLF) feature. With this feature, the user can monitor the status of the appearing station. If the programmer also assigns a DSS status button to the telephone, the user can press it to select between monitoring all of the telephone status or just its personal intercom status.

Also refer to the discussion titled *Intercom Number*.

Digital Voice Announce

The DVA is a line-powered device that provides voice prompts for auto-attendant and transfer, or you can use it to enhance the operation of DISA and Tracker. However, you *must* have DISA assigned for DVA to function. The DVA is designed to interface with a digital station port and is easy to install and program. You perform all DVA programming through the "Attendant Level" programming, though there are some DXP programming steps as well. It isn't necessary to send DTMF or ringing signals to the unit to activate it because the DISA programming determines the DVA's actions. When you use DVA in conjunction with DISA, the DXP *Plus* automatically answers CO lines and guides callers with voice prompts.

Connect the DVA to any vacant digital station port. The DVA self-identifies to the CPU in the DXP so you don't have any phone-type programming to do.

The DVA accepts and stores up to four recorded messages, with a total maximum recorded time for all messages of two minutes. The system attendant or installer can divide this two-minute period as necessary among the four messages or use the entire two minutes for one message. These pre-recorded messages play during an in-process call. Single digit dialing is allowed during each of the four prompts. The system attendant or installer can store the customized messages (prompts) into the DVA device by delivering them from the attendant's station. The DVA interfaces with the DXP through any of its unused digital telephone station ports. The maximum number of DVA units you can install is limited only by the number of DXP station ports. If you install multiple DVAs, the DVA functions as an automatic attendant, and it enhances the operation of direct inward system access (DISA) by providing automated voice prompts and dialing instructions to callers. In general, the voice prompts are of the categories listed in the examples following this description.

You control the day versus night messages by programming the day 1, day 2, and night ringing begin and end times in the system parameters menu. The system goes into the night mode either manually by the attendant or automatically each day when the programmed times occur. When the system is in the night mode, the night menu message plays versus the day menu message; likewise, the night routing message plays versus the day routing message.

Message types, such as welcome greetings and recall-no-answer messages are indexed within the system by a two-digit number (example: *10* = Welcome Greeting 1, *11* = Welcome Greeting 2, and so forth).

A single-digit number appended to many of the message-type names (example: Welcome Greeting *1*, Welcome Greeting *2*, and so forth) is used for grouping similar types of messages together to prompt callers. For example, a company sharing the telephone system with several departments may assign all messages in group 1 to the sales department and all messages in group 3 to the customer service department. This allows DISA lines coupled with voice prompt 1 to seek welcome group 1, and DISA lines coupled with voice prompt 2 to seek welcome greeting 2, for departmental applications.

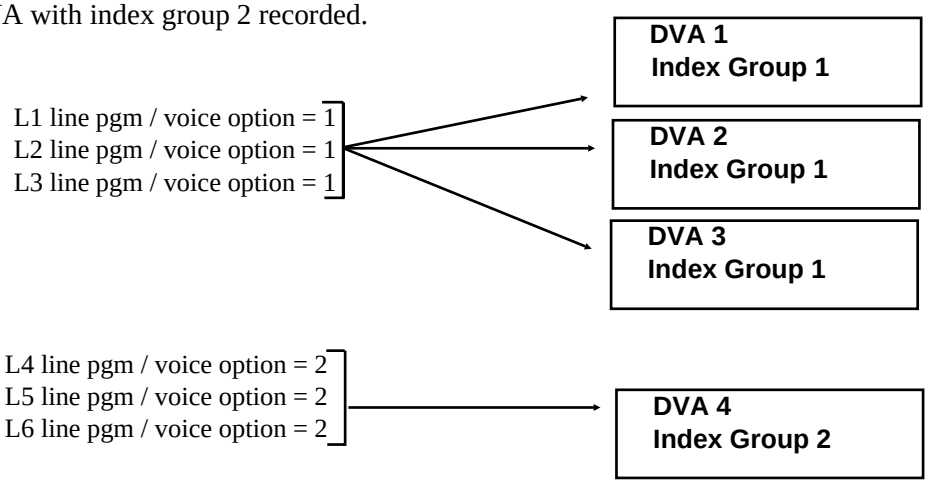
When programming DVA voice menus (example, press 1 for sales, 2 for customer service ...), you can also enter feature codes as well as intercom numbers in the Voice Digit Translation menu. For example, if you have installed the Tracker Paging System option, you can program the Tracker Pager access code (*8) into one of the single-digit translation locations. This allows callers to track the called party by pressing the appropriate single-digit button on their telephone when prompted by voice message. The caller then enters his or her call-back number and the # symbol to complete the page.

NOTE: DVA prompts are shared; for example, if you make eight different recordings, with two DVAs, they will be distributed in both units. If one DVA fails or is removed, then only the remaining messages will play.

DVA continued on next page. . .

DVA Continued . . .

Lines are associated with DVAs by "Line Pgm," DVA voice option. For example, in the diagram below, lines 1, 2, and 3 are programmed for "voice option 1" and will be answered by any DVA unit with index group 1 prompts recorded. Lines 4, 5, and 6 are programmed with voice option 2 and will be answered by the DVA with index group 2 recorded.


L1 line pgm / voice option = 1
L2 line pgm / voice option = 1
L3 line pgm / voice option = 1
DVA 1
Index Group 1
DVA 2
Index Group 1
DVA 3
Index Group 1
L4 line pgm / voice option = 2
L5 line pgm / voice option = 2
L6 line pgm / voice option = 2
DVA 4
Index Group 2

The following are examples of DVA voice messages.

Welcome greeting

This greeting identifies your company or business. *Example: "Welcome to Acme Company, one of our agents will be with you as soon as possible."*

Day message

This message represents the main menu prompt used during normal daytime hours.

Example 1: "If you know your party's extension, dial it now; otherwise, stay on the line—an operator will be with you shortly."

Example 2: "To reach engineering, dial 1; to reach customer service, dial 2; to reach sales, dial 3; otherwise, stay on the line—an operator will be with you shortly."

Night message

The night message is used after normal business hours have ended. Example: "Our office hours are from eight to five. Please call back tomorrow."

Recall no answer messages

Whenever a station is dialed from a DISA line and is not answering, the system plays a recall no answer message to the caller. Example 1: "The party you have reached is unavailable at this time." Example 2: "The party you have reached is unavailable at this time. Dial 1 followed by your call-back number and pound symbol to track the called party or dial 2 to leave a voice message."
NOTE: In example 2, the installer must install the Tracker Paging System and proprietary voice mail options.

Recall busy message

Whenever a station is dialed from a DISA line and is busy, the system plays a recall busy message to the caller. *Example: "The party you have reached is unavailable at this time—please dial another extension or dial zero for the operator."*

Hold message

This prompt is used during DISA calls and is activated when the called party is being paged with the Tracker Paging system. *Example: "The party you have reached is being paged—please hold."*

DISA authorization code message

This message prompts callers to dial their DISA authorization code. Example: "Please enter your authorization code at this time."

Feature access message

Before a caller using a DISA line can access system features, he or she must dial the proper feature code.

*Example: "The following features are available. Dial *01 for system speed dial access, *8 for Tracker Pager, or hold and you will be assisted by an operator.*

Drop message

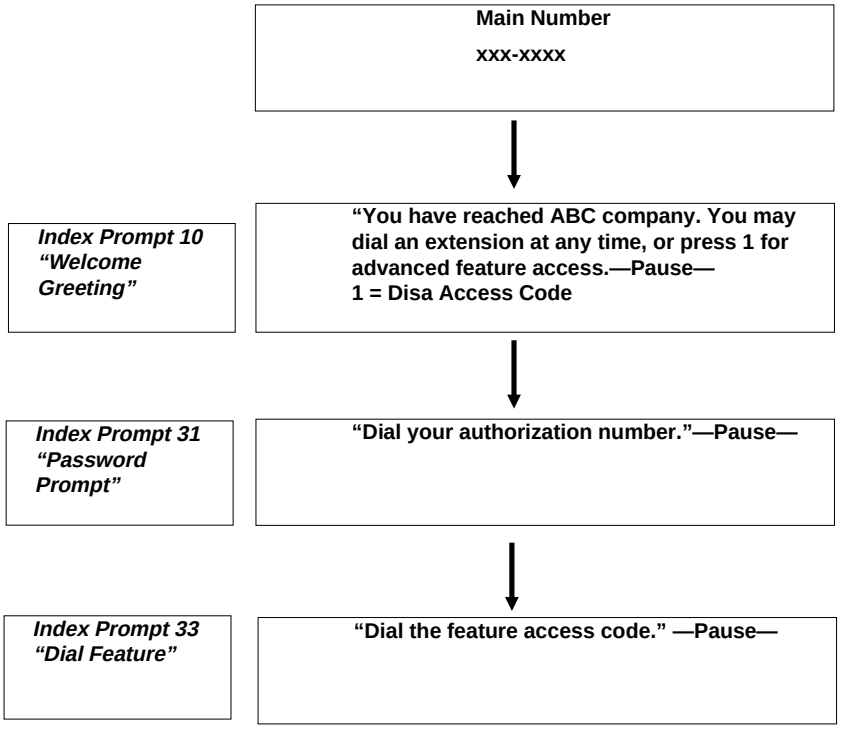
This prompt is used when a DISA call cannot be completed (not enough system resources available, wrong access code dialed, or feature dialed is busy).
NOTE: The call is not routed to the attendant–the message plays, then reorders.
Example: "Your call cannot be completed at this time. Please try again."

DVA / DISA

You can enhance the security of DISA by using the DVA. The DXP seizes the incoming call based on the "DISA assignment" parameters, and the DVA plays the appropriate prompts to enhance the following items.

DISA access code,
Authorization code,
Feature access code.

For example:

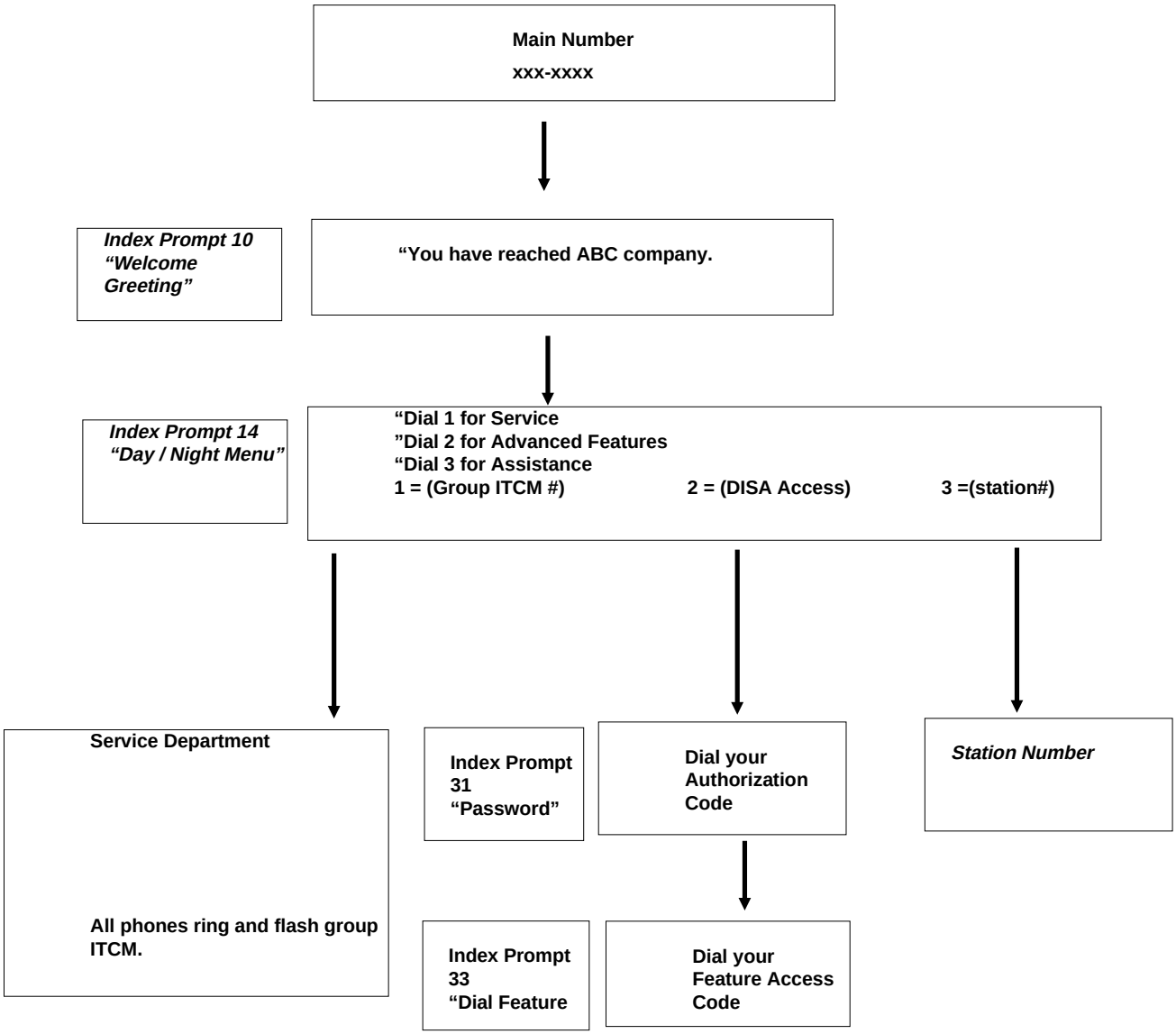

Main Number
xxx-xxxx
Index Prompt 10 "Welcome Greeting"
"You have reached ABC company. You may dial an extension at any time, or press 1 for advanced feature access.—Pause—
1 = Disa Access Code
Index Prompt 31 "Password Prompt"
"Dial your authorization number."—Pause—
Index Prompt 33 "Dial Feature"
"Dial the feature access code." —Pause—

DVA/ Auto Attendant with Single Digit Menu

The DVA functions as an auto attendant, giving callers single-digit dialing options. The DXP seizes the incoming call based upon the "DISA assignment" parameters, and the DVA plays the appropriate prompts.

Welcome Greeting
Day Main Greeting—Menu choices
Recall Busy
Recall No Answer

For example:

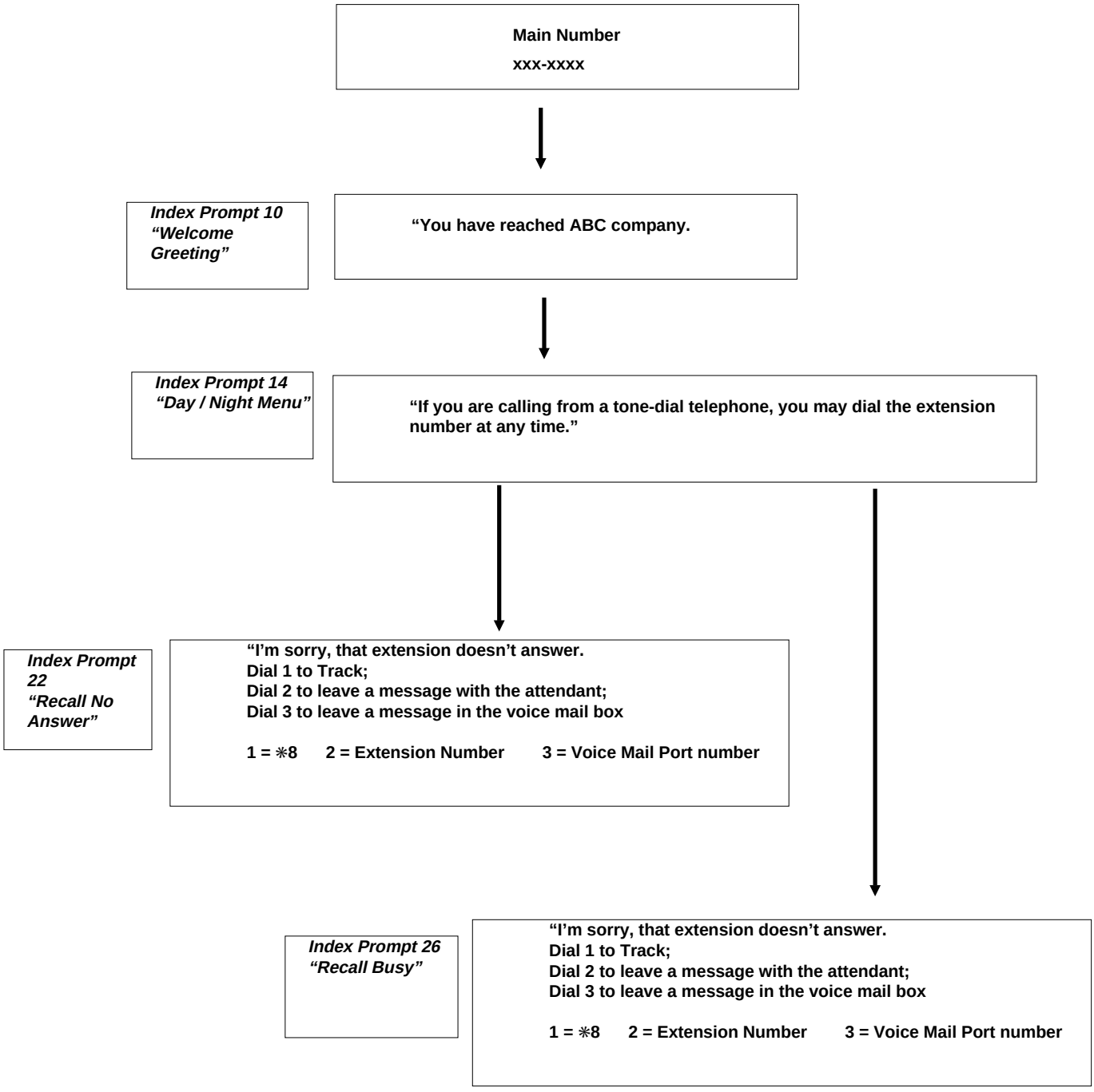

Main Number
xxx-xxxx
Index Prompt 10 "Welcome Greeting"
"You have reached ABC company.
Index Prompt 14 "Day / Night Menu"
"Dial 1 for Service
"Dial 2 for Advanced Features
"Dial 3 for Assistance
1 = (Group ITCM #)
2 = (DISA Access)
3 =(station#)
Service Department
All phones ring and flash group ITCM.
Index Prompt 31 "Password"
Dial your Authorization Code
Station Number
Index Prompt 33 "Dial Feature
Dial your Feature Access Code

DVA / Tracker

The DVA gives caller's single digit dialing access to the Tracker paging system. The DXP seizes the incoming call based upon the "DISA assignment" parameters, and the DVA plays the appropriate voice prompts.

Welcome Greeting
Day Main Greeting—Menu choices
Recall Busy
Recall No Answer

For Example:


Main Number
xxx-xxxx
Index Prompt 10 "Welcome Greeting"
"You have reached ABC company.
Index Prompt 14 "Day / Night Menu"
"If you are calling from a tone-dial telephone, you may dial the extension number at any time."
Index Prompt 22 "Recall No Answer"
"I'm sorry, that extension doesn't answer.
Dial 1 to Track;
Dial 2 to leave a message with the attendant;
Dial 3 to leave a message in the voice mail box
1 = ✳8 2 = Extension Number 3 = Voice Mail Port number
Index Prompt 26 "Recall Busy"
"I'm sorry, that extension doesn't answer.
Dial 1 to Track;
Dial 2 to leave a message with the attendant;
Dial 3 to leave a message in the voice mail box
1 = ✳8 2 = Extension Number 3 = Voice Mail Port number

Dynamic Save Button

Unprogrammed buttons at multiline telephones are available for the user to dynamically save dialed numbers. To save a number, the user presses any unprogrammed button before hanging up after he or she has dialed a number. To dial the saved number, the user presses the same button and the system automatically dials the saved number. Saving a number over a previously saved number erases the old one and stores the new one in place of it.

E

E & M Tie Line Support

Extension Hunting

When an E and M tie line call rings at a station that the programmer has disabled though programming action, the system routes the call through the disabled station's hunt list until it locates a group intercom for the call to ring. Should all group intercoms be busy or should no one answer the call in a programmed number of rings, the system then routes the call along the station's call forwarding arrangement. With a hunt list containing up to eight assigned group intercoms and access to each group intercom available to several system stations, many users have an opportunity to service an E and M tie line caller. Coupling this flexibility with the station's call forwarding ability, provides many chances for system users to service E and M tie line calls. A programmer could program a hunt list and a call forwarding scheme to an unassigned station and provide a designated E and M tie line termination and routing center. There would be no need to connect a telephone to the station port to use the feature in this manner. The programmer could arrange several E and M tie line termination centers to service different extension numbers. Each extension number could represent different calling categories, and ring at different blocks of system stations (Also see ***Multipurpose Line Board Support*).**

End-to-End DTMF Signaling

The system accepts DTMF tones or digital signals from proprietary telephones and sends them as DTMF tones through the public telephone network where they are received at a distant end for computer, voice mail, or other peripheral feature access.

End-to-End Signaling On Intercom

After establishing an intercom call, the system can continue to send and receive dialing signals (DTMF tones) through the intercom path. This feature can be performed from every station in the system and is used by peripherals such as a VMI–X or ATI–D–1PT accessory unit for voice mail.

End-to-End Signaling On Lines

After a user has established an outside call, the system can continue to send dialing signals (DTMF tones) through the public switched network and have them received at the distant end for inward call completion (bank by telephone, voice mail). Users can perform this conventional, on or off-hook dialing feature from every station in the system.

Enhanced Line Appearance

Refer to *Line Appearance, Enhanced*

Exclusive Hold

Refer to *Hold, Exclusive*

ExecuMail Integration

The DXP supports the ExecuMail voice mail system through an appropriate interface device. The ExecuMail system provides voice mail boxes where callers can leave messages to station users when the users are not available to answer their telephones. The ExecuMail system camps incoming calls that encounter busy ports so that they can recall when a voice mail part becomes available.

Also refer to the paragraph titled *Voice Mail Integration Digits.*

Executive Override

This feature allows the user of a station, upon encountering a busy signal at another station, to dial a special code that will override the busy condition, sound a warning tone, and allow caller access to the existing conversation.

Conditions for executive override are as follows:

- Calling station has class of service that enables busy override.
- Calling station is switched to override voice path.
- Called party may respond and will be heard by calling station and outside party.
- When the calling party dials the override code, the called party receives several tone bursts.

Also refer to the feature discussion titled *Do Not Disturb.*

Executive Override Advisory Tone

Beginning with software 9A, the executive advisory tone allows programmers to configure the system to provide an audible tone whenever a system user activates the executive override feature. Programmers can select this tone as either a one time tone or as a periodic reoccurring tone. If they choose a reoccurring tone, they must select the time interval between the reoccurring tones.

Executive Override Block

As a class of service feature, the programmer can block executive override at a station. When a station is blocked, a caller cannot override a busy condition and break into an on-going conversation at the called station.

Extended DTMF Tones

The installer can program the length of the DTMF tones associated with automatically or manually dialed numbers on analog telephones. This feature allows the system to access equipment such as answering machines, banking computers, voice mail equipment, that requires DTMF tones longer than the defaulted 80 msec. tone. To use the feature, the user programs the digits that require longer DTMF tones into speed dial locations or waits until the DTMF dialing time threshold exceeds the limit.

Extended DTMF Tones For ExecuMail

The programmer can set different DTMF tones for ExecuMail Stations. The system defaults the length to 80 msec., but the programmer can set other tone lengths as needed.

External Paging Interface (External Paging Port)

The external paging port, available on the services circuit board, provides an interface for external paging equipment. When the programmer assigns the external paging port to a paging zone, announcements to that zone are sent through the external paging equipment installed at the port. When the programmer assigns one of the relays that are available on the central processor unit circuit board to the paging zone, it provides a dry-contact actuation for the duration of the page to that zone. Typically, the installer wires the system so that this actuation enables the external paging equipment while the paging signal is sent through it.

The programmer can program a line port as an external paging interface for an external paging amplifier. When this feature is available, station users access the amplifier by selecting that line port. The paging line port accepts dialed DTMF tones to make a zone selection if the amplifier provides this function. When the programmer assigns a flexible ringing assignment to the external paging port, the external paging equipment responds to a ring signal and sounds the ringing over the paging loudspeaker. The programmer can assign one of the common audible ringer interface relays to track the ring signal that is supplied to this external paging port. Typically, the installer wires this relay so that its contact actuation enables the paging equipment.

Also refer to the discussions titled *Auxiliary Ringer Interface, Common Audible Ringer Interface, Flexible Ringing Assignments, Line Answer From Any Station,* and *Night Transfer (Of Ringing)*

F

Feature Inhibit

The programmer can disable a large array of individual features to provide a very basic telephone system when it is necessary. A basic system might be necessary at a site where a large proportion of the telephones are accessible to unauthorized users that may use them to tamper with the system, or such a system may be necessary for locations where users only need a narrow range of features to do their job.

Feature Renumbering

While the dialing codes for personal and group intercoms and for feature access are set by system default, they are flexible, and the programmer can renumber them when necessary. Feature renumbering may be necessary if personal or group intercom numbers must be in a certain block or sequence to match some site requirement (for example, numbering all telephones located on the third floor with 3nn numbers). If a new number assignment conflicts with a defaulted dialing code, the defaulted code can be reassigned into a block of unassigned numbers set aside for that purpose.

At default, the blocks of numbers are as follows:

101 - 292 = personal intercom

3101–3292, 4101–4292, 5000–5023 = group intercom

5024 - 5999 = unassigned —used for renumbering an assigned number so that the original number can be used for something else.

600 - 899 = feature codes

9 = line group 1

The programmer can reassign any number between 101 and 8999 to any intercom or feature code in any combination of three-or four-digits; however, the assigned numbers must not conflict with one another. For instance, if 211 is assigned as an intercom number, there cannot be any intercom or feature code numbered 21, 21n, or 21nn. Similarly, since 9 is defaulted as the code for line group one, there cannot be any intercom or feature code numbered 9n, 9nn, or 9nnn.

Flexible Ringing Assignments

The programmer can arrange ringing assignments for every station. He or she can arrange for this ringing to sound immediately as soon as the call appears on specified lines at a telephone (direct ringing) or after a system imposed delay (delayed ringing). Further, he or she can arrange for a telephone to ring when calls appear on specified lines during certain periods of the day or night. To program for flexible ringing, the programmer assigns lines to the direct and delayed ringing modes. He or she also divides a 24-hour period into three time blocks designated as day 1, day 2, and night mode and assigns lines to each of these categories. The programmer then assigns the direct, delayed, day 1, day 2, and night mode ringing designations to the various stations.

During the day 1 time period, calls on lines assigned to direct, delayed and day 1 categories all ring. During the day 2 time period, calls on lines assigned to direct, delayed and day 2 categories all ring. During the night time period, calls on lines assigned to delayed and night both ring.

The system also provides a manual night transfer (of ringing) feature that the attendant activates by dialing a code or pressing a preprogrammed button. While this feature is active, calls on lines assigned to delayed and night ringing both ring at the various stations; however, no other ringing occurs.

Also refer to the discussions titled *Auxiliary Ringer Interface, Common Audible Ringer Interface, External Paging Interface, Line Answer From Any Station,* and *Night Transfer (Of Ringing).*

Flexible Ringing Assignment Of The External Paging Interface

Refer to the discussion titled, *External Paging Interface.*

Flexible Station Numbering Plan

Refer to the discussions titled *Feature Renumbering* and *Intercom Number.*

Full Button Programmability Of Features

The programmer, and often the telephone users themselves, can make frequently dialed feature codes available at programmable buttons by storing the specific access codes necessary for dialing the features. They can store every feature access code, except those requiring TRANS/CONF button action, in a continuous string including button actuations and keypad digits up to a maximum of 16 digits per programmable button.

Also refer to the discussion titled *Programmable Button Flexibility.*

G

Group Intercoms

Refer to the discussion titled *Feature Renumbering* and *Intercom Number.*

Ground Start Line Support

Refer to the discussion titled *Multipurpose Line Board Support.*

H

Handsfree Answer Inhibit

The MUTE button on a multiline telephone will block all handsfree answerback response. This arrangement prevents a station user from monitoring another station site using the monitoring ability of the voice announce feature. When a user presses the MUTE button at his or her telephone, all handsfree answerback is disabled thus inhibiting any off-site monitoring. The mute light will remain on to indicate that this feature is active on digital telephones. On analog telephones, the monitor light will flash. Also refer to the discussion titled *Mute*.

Handset Volume Level (On Impact Telephones)

The installer can program the handset volume feature on Impact telephones to offer the station user more choices when selecting the handset volume level locally from his or her telephone. Normally, users have up to 8 volume levels that they can select. However, this programmed feature increases the user's handset volume choices to 13.

Headset Compatibility

Some proprietary multiline telephones are equipped with a headset jack. The programmer can enable a station port to allow headset operation with these telephone models. The programmer assigns, or in some cases the user can program, a programmable button at the telephone that the user can press to enable/disable headset port operation.

Hold

This feature allows a user to temporarily disconnect from a current call yet retain it so that it can be retrieved. When users place a call on hold, they are free to use their telephones for other calls or features and then return to the held call. At a multiline telephone, the user can put a call on hold manually, by pressing a HOLD button, or automatically (if programmed), by pressing another line button. Further, when a user presses the TRANS/CONF button to transfer a call, the system places the call on hold. The user can place a call on hold in either an exclusive or non-exclusive manner. Exclusive hold prevents a user at another telephone from retrieving a call held on a shared line. Non-exclusive hold allows any telephone that has line appearance of the held call to pick it up. The transfer hold is an exclusive hold condition. When a user answer a call on a group intercom and places it on hold, the system keeps this call on hold on the group intercom. This means that the user who placed the call on hold or any other user with access to that group intercom can pick up the held call.

The programmer must program each multiline telephone for manual or automatic and exclusive or non-exclusive hold. When he or she enables automatic hold at a telephone, it does not prevent users from using manual hold.

Also refer to the various discussions headed *Automatic Hold... .*

Directed Station Hold

This feature allows station users to pick up the last call a user placed on hold at another station. This feature does not allow users to pick up exclusive hold calls or calls that are in the process of being transferred. Also, the feature does not allow users to send a directed call hold to a station where its user is scanning the currently held calls. In addition, this feature allows users to place a call on hold at another station and have this call appear to be the one that has been on hold there for the longest time. Features such as hold recall apply to the station that sent the directed call hold and not to the station that received the directed call hold.

Hold, Exclusive

Exclusive hold prohibits a user from retrieving a held call at any station other than the one where it was placed on hold. The exclusive hold condition also links the held call to the timed hold recall timeout feature. After timeout, audible and visual signaling occurs and the exclusive hold condition reverts to a normal hold condition. The programmer enables or disables exclusive hold as a class of service feature.

Hold Queuing

The hold queuing feature allows a station user to put multiple lines on hold. The LCD speakerphone user can scroll through this queue of held calls by repeatedly pressing the HOLD button. The numbers or names of the held lines are shown on the LCD display. When the desired line appears on the display, the user presses TAP to retrieve it.

Hold Time Reporting

A programmer can arrange for the SMDR/SMDA parameters to convey either the cost of calls that the stations make or the amount of time that lines have been on hold at the stations. This time includes the actual hold time as well as the time waiting for transfers and conferences to be completed.

Hot Transfer

A hot screened call transfer allows users to first announce and then transfer both line and intercom calls from one telephone to another in a special manner. Once users have announced that they are transferring a call to another telephone, they can then take action to make the transferred call appear at the other station as if that user has already answered it. If the recipient of a hot transferred call is using a speakerphone, he or she merely begins the conversation with the distant party. If the recipient of the hot transfer is using a monitor telephone, he or she must lift the handset to reply to the distant party.

Also refer to the discussion titled *Call Transfer -Screened.*

I

I Hold And I Use Indications

The light associated with a line button provides a visual indication of the status of that line. When a user has a line in-use or on-hold at his or her telephone, the light indication provided is of a different flash rate than the indication provided at the other telephones in the system.

Idle Line Preference

With idle line preference, a telephone automatically connects to an assigned outside line that is idle and arranged for this feature. Connection occurs as soon as the user lifts the telephone handset. He or she does not have to press a line button.

The programmer assigns idle line preference to a station class of service and then assigns that class of service to a particular telephone. He or she also assigns the lines that are associated with the feature and the priority that these lines are to be available. If the programmer enables this feature and the prime line automatic feature together, the user gets his or her prime line upon going off-hook or an idle line if the prime line is in use.

Also refer to the discussion titled *Idle Line Priority.*

Idle Line Priority

When a programmer arranges for a telephone to have idle line preference he or she also specifies the order in which the idle lines are given to the station. Also refer to the discussion titled ***Idle Line Preference*.**

Industry Standard Telephone Support

The DXP supports industry standard (IST) telephones.

Distinctive Ringing

An industry–standard telephone can sound one ring cadence for intercom calls and another for for outside calls. You must select the ringing style in station class of service programming.

DTMF Receiver–Time-out

You can program the amount of time that the system waits to receive a DTMF tone on an industry–standard telephone. The DTMF receiver–timeout feature applies to the time between a user's lifting the handset and pressing a dialpad digit.

Do Not Disturb (DND)

You can dial a feature code (#01 by default) from your industry standard telephone and put the telephone into a do not disturb (DND) condition. While in this condition, an outside call forwards to another station or to the attendant according to the call forwarding feature. An intercom call will not ring the DND station and the system sends a fast busy signal to the caller to distinguish the DND from a standard busy line.

Flash Time

The flash time is the timed length of the signal delivered when a user presses the hookflash (or TAP) button. The installer can program both the minimum and maximum times that define the IST flash.

Hold Confirmation

Hold confirmation allows the industry–standard telephone users to have positive tone feedback while on hold.

Offhook Treated As Busy

When an industry-standard telephone user takes the telephone's handset off hook, the IST station appears busy to the system. This feature prevents the system from ringing an IST station while the station is idle and off hook making it unable to sound audible ringing.

Message Wait Retrieval Access Code

This feature allows IST station users to respond to a message waiting condition without using the central message desk. They do this by dialing a special intercom feature code that lets them respond directly to a waiting message.

Ring Frequency

The system programmer can set a ring frequency of 25 Hz for international applications or set a ring frequency of 21 Hz for domestic applications. He or she must choose a setting that matches the frequency of the installed ring generator.

Ring Patterns

Installer can program the ringing pattern for either IST ring mode one or IST ring mode two. Mode one causes a two-second ring phase while mode two causes a shorter one second ring phase. For this feature to function properly, the industry-standard telephone interface board must contain firmware revision 2C

Ringing on Busy

When an industry–standard telephone is busy on a call and another call comes to that telephone, the system sounds three quick tone bursts to the telephone's handset receiver. You must program the ringing on busy feature.

Industry-Standard Telephone Support continued on next page . . .

Industry-Standard Telephone Support continued . . .

Ringing Time-out

You can program the number of times that the system sends a ring signal to an industry–standard telephone on a system wide basis.

Ringing Patterns

The ringing pattern can be changed. Additionally, firmware revision 2C or higher must be installed on the DXIST (industry-standard interface) board. A ringing pattern (mode 2) with pulse durations half the normal ones (mode 1) can be programmed. This results in shorter ring phases of one-second duration.

Ringing Per Phase

Installers can bridge two ISTs at a single station port but the telephones share the same intercom number. When installers do this, it reduces the number of ISTs that can ring simultaneously from 96 per cabinet to 48 per cabinet. Bridged ISTs require programming action to match the systems ringing requirements to the installation parameters.

Ringing Time-out

You can program the number of times that the system sends a ring signal to an industry-standard telephone on a system-wide basis.

Subdued Off-Hook Voice Announce (SOHVA)

Users can perform a SOHVA from any telephone to an industry-standard telephone if the installer has programmed the IST in the SOHVA tables according to the SOHVA feature. Users can SOHVA the IST whenever it is busy on a line or the intercom. The IST user can not respond to a SOHVA call and his or her outside party will hear the SOHVA caller's voice.

Station Lock

This feature allows you to lock any local industry standard telephone (IST) being used with a DXP system. You enable this feature by dialing the feature code (default is #04) followed by your authorization code. You disable this feature by dialing only your authorization code after hearing the "enter your authorization code" fast tone. Your authorization code is programmed into the system by the installer. Also refer to the discussion titled Authorization Codes.

When this feature is enabled, access to lines and features on your telephone are denied to other users until you unlock or disable this feature.

Interactive Button Support

The system supports three interactive buttons on LCD speakerphones. These buttons and their associated expanded display messages provide quick easy access to system features and straight-forward button programming without the need for dialing codes.

Line Out Softkey Option

Beginning with software release 9A, the programmer can select between two different interactive button menu options that LCD speakerphones display when connected to outbound lines for outgoing calls. Specifically, this action substitutes a release (RLSE) button for the automatic redial (ARDL) button. This feature enhances DXP installations within the international community because some nations have specifications in place that disallow automatic redialing.

Intercom Hunt List

You can place personal intercom and group intercom numbers in a hunt list. When a user makes a call to a busy hunt list number, the system searches the list for an idle number to ring. The system allows you to place up to eight intercom numbers in a hunt list, either all group intercom numbers or one personal and seven group numbers. Refer to *Intercom Number—Intercom Hunt List.*

Intercom Number

The DXP system provides intercom support in several ways as described in the following paragraphs. The system provides 192 personal intercom slots and 408 group intercom slots for a total of 600 available intercom slots.

Personal Intercom Number

The system assigns a unique personal intercom number to every station, and the user of that station has exclusive use of that intercom number for making calls. However, telephone users can answer personal intercom calls that ring at another telephone or pick up non-exclusive calls that are on hold there. At default, the personal intercom appears on a telephone at the intercom button, but it can appear at any button that the programmer maps for that purpose. Personal intercoms can hunt to other personal or to group intercoms, depending upon programming.

Group Intercom Number

Group intercom numbers are those that are shared for use by several stations. Any time someone calls a group intercom number, all stations assigned to the number will ring. The programmer, through station programming methods, enables a station's ability to answer and originate calls on a group intercom number. He or she also maps the buttons on a telephone at which the group intercom numbers are to appear. The lights associated with these buttons show activity status of the group intercom numbers. In addition to normal intercom activity, a group intercom can show the appearance of a line that normally does not appear at the telephone (such as one carrying a transferred call). Group intercom numbers can appear in intercom hunt lists; however, a particular group intercom number can appear in only one hunt list at a time.

When a user selects a group intercom and dials a line group code to select a line or dials a code to retrieve a call from a park orbit, the system places the subsequent line appearance on the group intercom that the user preselected. the line appearance remains at that group intercom until the user finishes his or her call, parks it, or transfers it to another telephone.

Station Monitoring

The programmer can make the personal intercom number of one telephone appear at a button on other telephones in the system. Users at those telephones can use the light associated with this button to monitor the idle/busy status of that telephone and press the button to make a call to the idle monitored telephone.

The degree of monitoring that users can do is determined by whether the station monitoring feature that is assigned to the telephone is on or off. The type of monitoring that they can do is determined by whether their telephones have a status button that they can use to choose one type of monitoring in place of another.

When the station monitoring feature is off, the status light shows the state of the monitored telephone. If the user's telephone has a status button, he or she can press it to show the busy/idle state of just the personal intercom number of the monitored telephone.

When the station monitoring feature is on, the status light shows activity status (idle, ringing, busy, and hold) of the monitored telephone.

The programmer must map a telephone button for each personal intercom that is to appear and, if desired, map a status button for the user to switch between the types of monitoring. Also, she or he must enable station monitoring as a class of service feature and assign that class of service to those telephones where monitoring is required.

Intercom Hunt List

The programmer can group up to eight intercom numbers together at an individual telephone to form an intercom hunt list. The eight numbers can include one personal intercom number and seven group intercom numbers or eight group intercom numbers.

When someone calls a telephone and it is busy, the call will go to the first idle number in that telephone's hunt list and then ring every telephone that has access to that number. An outside line call to a busy telephone will always go to the hunt list; however, an intercom call will not. To make an intercom call route to the hunt list, the programmer must include the personal intercom number of that telephone in the hunt list. The system will not allow you to assign a group intercom number to more than one hunt list at a time.

When a user has set his or her telephone to forward just prime line and personal intercom calls, those calls will forward while any other calls to that telephone will go to the hunt list. When a user has set his or her telephone to forward all calls, then all calls forward and none go to the hunt list.

Also refer to the discussion titled *Feature Renumbering.*

Intercom Time-out

Should the user select the intercom for use and then perform no dialing or other action, the intercom will timeout after 10 seconds (at default) and return the telephone to an idle state.

Intercom Call Progress Tones

Internal call progress is marked by the following special tones: Dial tone sounds steady; ring back tone sounds one second on and three seconds off; tone signaled internal call sounds a two-tone burst every four seconds at a called station and returns to the caller as ring back; voice signaled internal call sounds a single tone burst at a called station and returns to the caller as two tone bursts; busy tone sounds one-half second on and one-half second off at the calling station, and do not disturb tone sounds a fast busy tone when the called station is in the do not disturb mode. (The system only supplies OPX ports with the regular busy tone since fast busy tones could interfere with the operation of some accessories that can be connected to these ports).

Intercom Inter-Digit Dialing

A timer begins timing out after the dialing of each number during intercom number dialing. It also begins a timeout whenever the station user accesses the intercom number path and does not dial any digits. When the timer times out, the system returns the station to an idle state.

K

Key/Hybrid Configuration

Either key system or hybrid configuration is available with the DXP digital communications system. Whenever the programmer assigns outside lines into line groups and gives individual stations access to those line groups, the system automatically places itself into the hybrid configuration mode. The installer does not have to make any physical adjustment to the equipment to achieve the hybrid configuration mode. The Federal Communications Commission rules and regulations, Part 68, designate a fully protected hybrid configuration as an MF equipment type category and a key system configuration as a KF equipment type category. The installer must report the appropriate category registration number to the telephone company. Operationally, the hybrid configuration enables a PBX feature that may incur a higher monthly tariff to the telephone company.

L

Last Number Redial

The system provides each station with a last number redial feature. This feature saves 16 digits of the last outside number dialed at the station. A newly dialed number always replaces a previously dialed number. When the user presses the last number redial button, the system will choose a line and redial the saved number. The system will choose the last line used and redial the number. If the last line used is busy or is unavailable, the system will choose the prime line. If they both are unavailable, the system will choose any line assigned to idle line preference. If this is busy or unavailable, no further system action is taken; you must hang up and retry later when a line is available.

Line Access Restriction

Refer to the discussion titled *Access Denied.*

Line Answer From Any Station (TAFAS)

The programmer can assign one or more of the four relays, which are located on the central processor board, to track the ring signal on any or all lines that he or she assigns to them. The programmer can arrange for the tracked ringing to be during the direct, delayed, day 1, day 2, or night ringing modes. Typically, the installer wires a relay so that its contact actuation causes an external bell or other device to sound. Station users can hear an external ringer and dial a code. When they do this, the system allows their stations to answer any line that the installer has assigned to that external ringer through the relay programming. Since each site installation can be unique, the installer must explain to the users which dialing code answers which external ringer.

Also refer to the discussions titled *Auxiliary Ringer Interface, Common Audible Ringer Interface, External Paging Interface, Flexible Ringing Assignments,* and *Night Transfer (Of Ringing)*

Line Appearance, Enhanced

When a telephone user selects a group intercom and dials a line group code to select a line or to retrieve a call from a park orbit, the system places the subsequent line appearance on the group intercom that the user preselected. The line appearance remains at that group intercom until the user finishes his or her call, parks that call, or transfers it to another telephone.

Line Groups

The programmer can assemble and program outside lines together in up to 16 different line groups. Users can access each group by dialing a different access code or by pressing a line group button. The programmer can use this feature to reserve certain lines for certain clusters of stations for a tenant-service arrangement.

Line Group Access

The programmer can assign certain line groups to certain stations for call origination purposes. Stations may also be denied access to certain line groups.

Line Queuing

When several telephones share a line and that line is busy, a user can dial a code and hang up to wait for the line to become idle. When the line becomes idle, the user's telephone will ring.

Liquid Crystal Display Support

The system supports the use of LCD speakerphones having a liquid crystal display (LCD). The LCD speakerphone display may shows many useful messages that guide station users through many calling situations.

Enhanced LCD Display

The installer can program the system to enhance the display of an LCD-equipped telephone so that it shows both the name of the calling station and its personal intercom number.

Liquid Crystal Display Messaging

A user can set standard and system supplied custom display messages by dialing a specific code at any telephone. When a user places a call from an LCD speakerphone, the preset LCD message from the called station will flash on the caller's LCD. When a user sets a message, the intercom number light at his or her telephone flashes to indicate that the feature is active. The attendant programs these messages form his or her position (30 messages are available).

Location Code

Software release 9A adds the location code feature to enhance system installation in the international community. When installers set this code for a particular nation where they have installed the DXP, the DXP system automatically defaults certain system parameters to a setting that meets specifications set forth by that nation's technical standards. Also see the discussions titled *Conference Advisory Code*, *Executive Override Advisory Tone* and *Line Out Softkey Option*.

Location Code 1 (USA)

- Standard system default codes for all system features.

Location Code 2 (South Africa)

- Standard system default codes for all system features except:
  — transmission and receive levels set to meet local standards,
  —frequency and cadence of call progress tones set to local standards.

Location Code 3 (Brazil)

- Standard system default codes for all system features except:

— transmission and receive levels set to meet locate standards,
—frequency and cadence of call progress tones set to local standards,
—conference advisory tone turned on and set to provide periodic reoccurring tone,
—executive advisory tone turned on and set to provide periodic reoccurring tone,
—Selectable interactive button menu for LCD speakerphone displays set to substitute a release (RLSE) button for the automatic redial (ARDL) button.

NOTE: Be sure to notify users of this button change as it is different from information provided in the user's guides.

Location Code 4 (Argentina and Chile)

Standard system default codes for all system features except:
— transmission and receive levels set to meet local standards,
—frequency and cadence of call progress tones set to local standards.

Lock Button

When the installer maps a telephone with this button, a user can press the button and dial an authorization code to deny other users access to lines and features at his or her telephone.
Also refer to the discussion titled *Authorization Codes.*

M

Manual Exclusion

Refer to the discussion titled *Privacy Release.*

Manual Reset

The system provides a button on the central processor unit circuit board for manually resetting the software. When someone presses this button, it causes the system to reset all lights, features, line states and station states.

Master Clearing The System

When master clearing the system, the installer can set the parameters to one of three settings.

Mode 1—"Key-Like Mode"

At default, assigns line appearances for every multiline telephone but does not assign group intercoms in any station hunt list.

Mode 2—"PBX-Like Mode"

At default, assigns no line appearances but does default two unique group intercom appearances for every multiline telephone in the hunt list.

Mode 3—"All-clear"

This option defaults the system with no button mapping, group intercom access, or extension numbers for stations.

Maximum Call Duration

This feature automatically cuts off calls on certain lines after a preprogrammed time. The system will not cut off calls made to an emergency number. The system sounds a warning tone at the busy station 10 seconds before it disconnects the call. The warning tone consists of one 800 ms burst followed by eight 100 ms bursts.

Meet—Me Answer Page

Any station user can dial a code in response to an all-call or zone page and be connected to the paging party in a private conversation.

Memory Retention Without Batteries

The database programming is electronically protected during AC power failures by an internal electronic component sometimes known as a “supercap”. The stored data will remain in memory for a minimum of 30 hours provided that the system has been powered continuously for approximately 30 minutes prior to the power failure or disconnection. The system clock will continue to run for at least 30 minutes after an AC power failure or disconnection.

Message Deposit

This messaging feature allows station users to call an LCD speakerphone and arrange for a message to be left on its display. The message is for the called party to read if he or she is unable to answer the caller.

Message Waiting

A special feature access code allows a station user to control the message waiting (MW) light at other stations in the system. When the message waiting light is turned on at a station, the user can automatically call the station that turned it on. Stations that include an LCD display show the source of the message.

The programmer can program one station as the central message desk and arrange it for exclusive message waiting control. The central message desk user can control message waiting lights and deliver messages to and from all other stations in the system. The programmer can also provide a programmable button for placing and retrieving message waiting calls. Single line telephones only utilize central message desk signaling. A station can have as many 8 message waiting lights stacked at one time.

Mnemonic Programming

Refer to the discussion titled *Programmable Button Flexibility.*

Modem Support

The system supports the operation of the DXMDM serial data modem. The DXMDM is a general-purpose, 300, 1200, and 2400 automatic baud detect, serial data modem that receives its operating power and configuration programming from the DXP system. The CPU board provides a dedicated serial data port for DXMDM modem use. If your installer connects the modem to a serial data port that is supplied by a communications card, he or she will need to program the system for modem operation on this port. Regardless of where the modem is connected, the system arranges for that port to automatically match the baud rate and serial data parameters of the modem.

The system also suports the operation of a customer-supplied modem connected to a serial data port that is supplied by a communications card.. This customer-supplied modem must be self-powered and must provide its own terminal ready and auto answer capability.

Modify Digits Table

Refer to the discussion titled *Automatic Route Selection.*

Multiple Attendant Positions

The system supports the operation of an attendant position at more than one station port.
Also refer to the discussion titled Attendant Position.

Multipurpose Line Board

The multipurpose line board provides system interface for ground start lines, loop start lines, and E & M Tie lines; these are typically the three line types that the central office (CO) makes available for connection. The multipurpose line board is programmable for each line type. You can have a maximum of two Tie lines on each multipurpose line board.

Music Interface

The services circuit board provides a modular jack where the installer can connect customer-provided music sources. Two different sources can be used so that the music supplied to parties while they are on hold is different than that supplied internally for background music. Also refer to the discussions titled *Background Music and Music On Hold.*

Music On Hold (MOH)

When an installer connects a customer-supplied music source to the system and the programmer enables the feature, music is provided to outside lines and intercom calls while they are on hold. Music on hold can be turned on or off system-wide by attendant action. Also see discussions titled *Music Interface and Background Music. You can program each line for either music on hold source.*

Mute

Each multiline telephone has a MUTE button that, when pressed by the user, will mute the handset transmitter (or internal microphone on speakerphones) to prevent the user's voice from being heard by the distant party. The mute light flashes to indicate a muted condition. Users can respond to a SOHVA by pressing the MUTE button and speaking to the SOHVA sender and releasing the button when they have finished their response. The button provides push-on/push-off operation on speakerphones. Also refer to the discussion titled *Handsfree Answer Inhibit and Subdued Off-Hook Voice Announce.*

N

Names (Station And Lines)

The programmer can name every station and line connected to the system for identification and programming purposes. On an LCD speakerphone, the name of called and calling stations appear in the display. When a user selects a line for use or when it is ringing on a call, the line name appears in the LCD speakerphone display.

Night Service Automatic Switching

The programmer can arrange the system to automatically enter and exit the night transfer (of ringing) mode of operation on a timed basis.

Also refer to the discussion titled *Night Transfer (Of Ringing).*

Night Ringing

The attendant can manually place the system in the night ringing mode by dialing a code or pressing a preprogrammed button. This mode overrides the direct, day 1, and day 2 automatic ringing modes. While this feature is active, calls on lines assigned to delayed and night ringing both ring at the various stations. No other ringing occurs unless the programmer has arranged for a loud ringing bell or other external ringing device to sound when calls appear on those assigned lines during the night ringing mode. These calls may be answered at any telephone in the system if the user dials the proper code.

When the attendant station includes a preprogrammed night transfer (of ringing) button, its associated light conveys the following system ringing status: day 1 ringing = steady on, day 2 ringing = wink with off time, night ringing = continuous wink, and manual night transfer (of ringing) = flutter.

Also refer to the discussions titled *Auxiliary Ringer Interface, Common Audible Ringer Interface, External Paging Interface, Flexible Ringing Assignments,* and *Line Answer From Any Station.*

Also refer to the discussions titled *Flexible Ringing Assignments* and *Line Answer From Any Station.*

O

Off-Premise Extension (OPX)

Installers can locate any industry-standard telephone away from the main premises served by the system. To enable this feature, they must use a proprietary interface device between the telephone and the DXP system and make the necessary programming entries.

On-Hook Dialing

Multiline speakerphones and monitor telephones provide manual and/or automatic dialing while it's handset is on-hook. An internal loudspeaker monitors call progress for completion (the user must take the handset off-hook to provide the voice link on non-speakerphone monitor stations).

Operator Station

The system programmer designate the station that you want to ring when system users dial the operator. Usually this station is an attendant position station; however, the operator station can be any station in the system. In other words, the operator station does not have to be an attendant position station if you do not want it to be one. Plus, the programmer can change the code that users dial to call the operator from a default of 0 to the dialing code of your choice.

Originating Denied

The programmer can deny users the ability to originate calls on certain lines or intercom numbers at certain stations. Originating denied does not prevent a user from answering a ringing line, retrieving a held call or receiving a transferred call.

Out-Dial Delay Time

With speed dialing, it is sometimes necessary for the system to wait a short time after selecting a line and before dialing the number. This wait period gives the telephone company switching equipment time to prepare to receive the dialed number. This feature provides a programmable wait time to match various types of telephone company switching equipment.

P

Paging Access

This feature allows station users to dial-up customer provided loudspeaker paging equipment and page over externally placed loudspeakers and determines what paging zones, if any, a station can page over.

Password Protection

No one can enter a programming mode to reprogram the system without first entering a password. The system provides two different entry levels for programming and allows for a different password for each entry. While the passwords are the same at default, a programmer can change them as needed to provide security against unauthorized program entries. The two programming entry levels are the installer level and the administrator level. Programmers can enter the installer level, using the installer password, to perform all programming functions including major changes such as master clearing or defaulting , feature renumbering, and diagnostics. They can enter the administrator level, using the administrator password, to perform most programming functions except those major changes just mentioned. When the system is initially installed and programmed, or at any later time as needed, the installer programmer can make the two passwords different to limit subsequent access to either programming level to certain special or authorized people.

The system also provides two entry levels for main station database programming and provides a different feature code for each entry. These feature codes default to certain values, but a programmer can change them as needed to provide security against unauthorized program entries. These two different programming entry levels are the system manager and the attendant levels. On-site system managers use the system manager feature code to make many program changes in the system, line, station, and station class of service parameters. Attendants use the attendant feature code to make routine changes in the day-to-day operating parameters of the system such as revamping LCD messages, adding system speed dial numbers, and setting the system clock.

The installer programmer can change the passwords and the feature codes from the default values to custom ones whenever a change is needed. Also, the system manager can change the feature codes at any time he or she chooses. When they change these passwords and feature codes, they should keep a record of the new ones since the default words and codes will no longer provide entry to the programming.

Pause Time

During speed dialing, it is sometimes necessary for the system to delay the sending of dialed digits to give telephone company switching equipment time to prepare to receive them. This feature allows users to store pauses as part of the stored number at the points in the numbering sequence where delays are required.

PBX/CENTREX/Central Office Compatible

System features and programmable buttons support the requirements of most PBXs, Central Offices, and CENTREX systems. Users can make numbers, #, *, programmable pauses, and flash signals a part of every stored number for access to host system feature codes.

PC Attendant

Refer to *Attendant Position, PC*.

Periodic Line Tone

This feature provides periodic warning tones to station users while they are busy on certain lines. The warning tone consists of one 500 ms burst, a 100 ms off period, and one100 ms burst. The tone reminds the users to keep their conversations short on these lines. The system programmer can enable this feature for a class of service of telephones and then specify the applicable lines. Further, he or she can select how often the tone sounds.

Personal Intercom Number

Refer to the discussion titled *Intercom Number.*

Personal Intercom Number Preference

When a telephone goes off-hook, the system automatically connects it to the personal intercom number assigned to the station.

Personalized Ringing Tone

This feature allows a station user with certain model telephones to choose one of several different ring tones to aid in distinguishing one ringing station from another.

Pooled Line Access

Refer to the discussion titled *Line Group Access.*

Power Failure Transfer

A power failure line connection is available on each line interface board for connecting industry-standard telephones such as a Comdial ATC or MaxPlus model. The system automatically connects these power-fail telephones directly to certain lines whenever there is an AC power failure. During a power failure, users can originate and receive calls on a power-fail station. The power-fail stations automatically disconnect as soon as power is restored.

Preselection

This feature provides an override to the automatic line preference. If a station user presses a line button on his or her telephone before lifting the handset, the station will go off hook on the selected line.

Prime Line

With this feature, a station automatically selects a line, line group, or intercom number for use when the user takes it off hook. The feature can be over-ridden if the user preselects another line, line group, or intercom number before lifting the handset. If the prime line is ringing, it is automatically answered when the user lifts the handset—this feature can be used along with ringing line preference functions. Also see *Ringing Line Preference.*

Printer Interface

The system makes a wide variety of printout records available through a serial data port provided by a communications card. The programmer can direct these printouts to the SMDR/SMDA data printer or to the screen of the programming PC. Also refer to the discussions titled *Communications Card Support* and *Serial Data Port*.

Privacy

Refer to the discussion titled *Automatic Privacy.*

Privacy Release

The programmer can assign a privacy button to a telephone. If a line has privacy release programmed for it, a user can press the privacy button to change it into a non-private one.

Private Lines

Lines may appear at one station port or at selected station ports for call origination and reception yet may not appear at other stations.

See the discussion titled *Direct In Lines.*

Program Printout

The system supports an RS-232 compatible, asynchronous serial data printer to the system. When a data printer is connected to a serial port, the programmer can command it to provide a printout of all or selected database data, and the system administrator or attendant can command it to print selected data.

Programmable Button Flexibility

The programmable buttons accommodate any combination of line appearances, features, speed dial numbers and other intercom numbers. A shift operation permits the station user to program speed dial numbers on the second level. Through the button mapping programming procedure, the programmer can assign functions and features to each button on every system station using a list of mnemonics (shorthand titles for functions and features that the system software understands).

A button may be programmed as one of four things:

1. Feature button (including line group access)
2. Line direct appearance button
3. Intercom number button (DSS/ BLF)
4. Speed dial button - If shift is used, a second level of autodial storage is available.

Also refer to the discussions titled *Square / Nonsquare Configuration,* and *Full Button Programmability Of Features.*

Programming Port

Refer to the discussion titled *Database Programming (From The Main Station).*

Pulse/Tone Switchable

If the installation site is in an area that supplies rotary (pulse) dialing lines from the central office instead of, or in addition to, tone (DTMF) dialing lines, the programmer can match the dialing mode of the line port to that of the line. If a rotary dial line is matched, further programming action matches the system with the pulses-per-second rotary dial signaling of the line. The system defaults the line ports to match tone dialing lines.

On those occasions when a user needs to send DTMF tones after making a call on a rotary line (to generate banking-by-telephone codes for instance), he or she can dial a # to convert the dialing mode to tone for the duration of the present call. The system changes it back to pulse when that call is completed.

Q

Quick Transfer

The quick transfer feature allows users to perform an automatic screened or unscreened transfer of an incoming line call without pressing their telephone's TRANS/CNF button. The transfer occurs automatically as soon as the user who answers the call dials the intercom number or access code for the transfer location. The system begins the call transfer process as soon as the user dials a digit on his or her dial pad, and effects the transfer as soon as the user hangs up or presses his or her telephone's RELEASE button. When installers activate this feature, it greatly reduces the keystrokes that users must take to transfer calls over a tie line.

R

Recall

Refer to the discussion titled *Timed Recall.*

Recall/Flash (TAP)

Refer to the discussion titled TAP *(Flash)/Recall.*

Relays

Refer to the discussion titled *Auxiliary Ringer Interface.*

Release Button

When a telephone is mapped with this button and a user presses it, the system discontinues the current active operation and returns the station to an idle state. When used along with an answer button, the release button provides rapid call handling.
Also refer to the discussions titled *Database Program Storage and Password Protection.*

Reminder Alert

A user can set up to two reminder alerts to sound at his or her telephone. The alert sounds at the station as four short tone bursts, which continue until the user responds to the alert by pressing CLEAR. This feature only works on digital stations that have interactive buttons.

Remote Programming And Diagnostics

Programmers can program the DXP system from a personal computer (PC) running the visual man machine interface (VMMI) program. The PC can be connected directly to the CPU board or connected by modem through the public telephone network. For remote programming to take place, an installer must connect the DXP modem between the RS232 2 port on the CPU board and an outside telephone line and connect a customer-supplied modem between the PC and an outside telephone line. In addition to database programming, installers with the proper password entry can perform maintenance routines and diagnose system malfunctions to the board level.

Remote Station Disable

This feature allows users at stations with the proper class of service to dial a code and remotely disable or enable another station. Normally, the installer should give this capability to the system attendant but could assign it to any class of service that is appropriate.

Response Messaging

Users can set messages to be received and displayed by calling LCD speakerphones. These messages give information on the status of the called telephone. The system attendant usually programs customized messages for use by the other telephone users, although the defaulted system does provide several general purpose messages for use.

Telephone users can program a response message button on their telephones if they wish. This response message button lets them make a non-verbal response to subdued off-hook voice announce calls or intercom calls using the attendant-prepared response messages.

Restricted Dialing Error Tone

When you dial a toll-restricted number from your telephone, you will hear an intercom error tone frequency with a continuous pattern of 250 ms on and 250 ms off. With earlier software, no audible error indication is given.

If you have a LCD speakerphone, the message EXT or Code is displayed. The message Dialing Denied is displayed instead.

Ring No-Answer (RNA) Call Forward

Refer to the discussion titled *Default Busy/Ring No-Answer*.

Ring Back On Busy

With this feature disabled, when someone calls another telephone and the calling party is busy on an outside line, the caller hears a ring back tone—not a busy tone. In this case, when the caller is using a non-display telephone he or she has no means of knowing the busy status of the called party. (LCD speakerphones can display called party status—for details on this display feature, see the paragraph titled *Allow Busy Display).* Installers can take programming action on a individual station basis that allows callers to hear a busy tone instead of a ring back tone when they call a party who is busy on an outside line.

Ring Back On Transfer

Beginning with software release 8C, installers have the ability to control what outside parties hear while the system transfers their calls to an internal extension. Prior to this software release, outside parties hear whatever the music on hold source provides. With software release 8C, programmers can select ringback tone in place of music on hold on a per line basis.

Ring Back Tone

By default, when callers call an intercom party, they receive an intercom ring back tone to tell them that the called intercom station is ringing. Also, when they call over the CO line, they receive a CO-style ring back tone to tell them that the distant CO telephone is ringing. Some system users find intercom ring back tone confusing. When installers encounter this situation, they can take this programming action to assign CO-style ring back tone to intercom calls on a system-wide basis.

Ring On Busy

If a user is on a speakerphone call (on certain model telephones) and a second call comes in to that station, a quick subdued tone burst sounds. If the user does not wish to hear this tone burst, the programmer can eliminate any ringing. For industry standard telephones, the system will send three short tone bursts through the handset.

Ringing Line Preference

When this feature is active at a station, a ringing line is automatically connected to a station when the user takes the handset off hook or presses the speaker button. No manual line selection is required.

S

Save Button Dial Storage

A user can dial digits and save them while on a call, which is useful should the distant party tell the user of a number to call and the user wishes to save that number for later redial.

Saved Number Redial

Refer to the paragraph titled *Dynamic Save Button*.

Screened Call Transfer

Refer to the feature discussion titled, *Call Transfer -Screened.*

Secure Account Code Display

Software release 8C enhances the SMDA/SMDR feature. Prior to software release 8C when a caller dials his or her account code, the LCD speakerphone displays the dialed digits. With software release 8C, the system programmer can activate the secure account code display that causes the LCD speakerphone to display a ✻ for each digit instead of the dialed account code digits.

Self Diagnostics

Each station can execute a self test when so enabled. This test verifies processor, indicator, and tone function.

Serial Data Port

The system provides two RS-232 serial data ports on the central processor unit circuit board. If necessary the installer can provide additional serial data ports by installing communications cards on auxiliary boards. Each communications card provides four ports and each auxiliary board supports two communications cards. With the system supporting two auxiliary boards, a maximum of 16 auxiliary serial data ports can be made available for use.

The installer must connect the video display terminal (VDT), used to perform database programming to either CPU board data port (RS232 1 or RS232 2). When a serial data printer is required, the installer should connect it to RS232 2. Data interface and handshaking parameters for the data ports are programmable so that the system can match a range of customer-supplied equipment.

The distance between the data device and the common equipment can be up to 500 feet in a quiet electrical environment. Long runs may dictate the need for shielded cable at some sites. For longer distances, the system installer must install a limited distance modem to relay the data communications between the common equipment and the data device.

Service Observing

Service observing is programmable as a station class of service feature. It allows users to enter an in-progress call in an unannounced muted mode, to monitor the conversation. No warning tones sound when users make the call entry. This feature is useful in allowing a supervisor to monitor the performance of an employee during a phone conversation with a client. In order for a station to use the service observing feature, that station must have the initiate observe feature allowed and the telephone being observed must be programmed as observable while service observing is activated. The station that is being observed can continue to answer or originate multiple calls without disrupting the observing station.

Shift Button

The programmer can button map a certain station to have a SHIFT button. If a telephone includes a SHIFT button, the user can press it to reach a second level of speed dial storage.

Also see the paragraph titled *Station Speed Dial.*

Silent Mode Button

When a telephone is mapped with this button, the user can press it to turn off the ringer at his or her station for the duration of the current ringing call. Ringer operation is restored when a new call rings at the station.
Also refer to the discussion titled *Programmable Button Flexibility.*

Single-Line Proprietary Telephone Support

The system supports a proprietary single-line telephone. The single-line telephone provides basic intercom service coupled with the ability to access outside lines and system features through special access codes. The programmer identifies the station port for single-line telephone use.

SMDA Reports

The system will automatically provide an SMDA report whenever the costed call storage reaches 95 percent of capacity. The programmer can arrange the system to print the reports automatically at a specific time in the order that they are specified. The attendant can view the number of free records or delete all stored records. Deleting all stored records insures that the system is storing only the latest SMDA reports and provides a known starting point for record storage. Also, the installer can use the programming terminal to view the number of free records and delete all the stored records. Any call records created between the time the report printout was started and completed will not be printed or deleted. If the reports are not deleted after they are printed, a later command to delete records will delete all records at that point and not just the ones that were printed in the previously generated reports. The programmer can arrange for the system to always delete the records after they have been printed. The attendant can request particular reports at any time they are required.

If the programmer arranges the system to use account codes, they can be used to identify calls by category or by any other desired grouping so that costing by that category or grouping can be reported.

There are four different Station Message Detail Accounting reports. They are as follows:

- Detailed report sorted by stations
- Detailed report sorted by account codes
- Line summary report
- A general output of all records

SMDA Reports—Call Costing / Hold Time

The programmer can also choose between call costing reports and hold time display reports. The hold time display feature reports the accumulated time a line has been on hold; call costing reports the estimated cost of the call.

Speakerphone Support

The optional speakerphone provides handsfree operation of all features.

Speed Dial Sets

Refer to the discussions titled *System Speed Dials* and *Station Speed Dials.*

Split Button

When a telephone is mapped with this feature, the user can press the button to switch between the last call (intercom, outside line, or conference) that they placed on hold and their current active call.
Also refer to the discussion titled *Programmable Button Flexibility.*

Square/Non-Square Configuration (Button Mapping)

Refer to the discussion titled *Programmable Button Flexibility,* and *Full Button Programmability of Features.*

Station By Station Privacy

See the discussion titled *Automatic Privacy.*

Station Call Transfer

Refer to the discussions titled *Call Transfer -Unscreened, Call Transfer - Screened.*

Station Camp-On, Callback

Refer to the discussion titled *Camp-On With Automatic Callback*

Station Class Of Service

The programmer can enable or disable a group of features and parameters to provide a particular class of service (COS). The system permits the arrangement of up to 32 different classes of service. After programming the COS features, the programmer then programs individual stations to exhibit one of these different classes of service. He or she usually chooses certain COS features to match a particular group of users and then programs the stations assigned to these users to exhibit that COS.

Station Hunting

Station hunting is a future feature that will be available to systems with a software revision of 10A and later. Station hunting provides a means of routing both intercom and outside calls through an installer-determined grouping of stations. This call routing continues to a designated overflow location in case of no answer or if all stations in the hunt group are busy. Station hunting works equally well with intercom, standard central office (CO) lines, direct inward dialing (DID/DNIS) lines, direct inward system access (DISA) lines, and E&M tie lines.

For station hunting purposes, stations are considered busy under the following conditions:

- when they are currently connected with a call (internal or external),
- when they have an incoming call currently ringing,
- when they have a call on hold, in DND, call forwarded, out of service or being intercepted by an OAI application.

The installer can enable default call forwarding for a hunt group station. This feature allows the system to forward the non-hunt group routed calls that a station receives. Calls routed to a station by the station hunting feature ignore the default call forwarding settings. The installer can assign all types and any number of lines to ring at a hunt group. He or she can assign the lines as direct, delayed, day 1, day 2 or night ringing lines.

Hunt Group Attributes

Pilot Extension: This is the extension number that callers dial to call or route calls to this hunt group. The pilot extension number is similar to a personal intercom number, or extension number, and follows the same numbering plan restrictions. When station hunting is used with DID/DNIS, the pilot extension is the extension number assigned in the DID/DNIS translation table. When station hunting is used with DISA, the pilot extension can be the extension number assigned to the singls digit translation for the digital voice announce (DVA) message associated with the DISA line.

Name: The hunt group's name is the seven character alphanumeric name of this group that is used for LCD display and reference.

Full Name: The hunt group's full name is the 20 alphanumeric character name of the group that is used by OAI applications. (Future development will support OAI access and control of station hunting.)

Direct Ring Lines: The list of lines that directly ring at this hunt group when the system is not in the night mode of operation. This list can contain any lines in the system.

Delayed Ring Lines: The list of lines that delay ring on this hunt group. This list can contain any lines in the system.

Day 1, Day 2, Night Ring Lines: The lists of lines that can ring this hunt group during these programmed times. These lists can contain any lines in the system.

Member Stations: The list of stations that are members of this hunt group. This list can contain all stations in the system but is limited to personal intercom numbers only.

Overflow Destination: The overflow destination is a station intercom number, a group intercom number, a voice mail number, or another hunt group pilot extension where the system routes unserviced hunt group calls.

Queue Ringing Calls: With the queue ringing calls feature disabled and if all stations in the hunt group are busy, the sytem immediately routes hunt group calls to the overflow destination. With the queue ringing calls enabled, in the case of no answer or if all stations in the hunt group are busy, hunt group calls wait in a queue to be answered until an overflow timer times out then route to the overflow destination.

Types Of Hunting

Terminal Hunting: Terminal station hunting always delivers a call to the first idle station programmed in the hunt group. If the station does not answer within a programmed amount of time (programmed as the Call Advance Timer), the system delivers the call to the next sequential idle station programmed in the hunt group. The system makes no attempt to balance the distribution of incoming calls as this is a linear search through the programmed list. The search starts at the beginning of the list for each incoming call.

Distributed Hunting: Distributed station hunting delivers a call to the next idle station in the hunt group after the station that received the previous call. If that station does not answer within the programmed call advance time, the system delivers the call to the next sequential idle station programmed in the hunt group. This hunting method is a linear search through the programmed list; however, the search starts wherever it left off after the previous call.

Longest Idle Station Hunting: Longest idle station hunting delivers a call to the station that has been idle for the longest period of time since completing the last call that was routed to it by the station hunting feature. In the case of stations with equal idle times (such as at system startup), the system picks the first of the grouped stations with equal idle times. If that station does not answer within the call advance time, the system delivers the call to the station with the next longest idle period.

Ring All Station Hunting: Ring all station hunting is not a true hunting method. This method delivers a call to all idle stations simultaneously. This is a good method to use when the site requires that all calls be answered as quickly as possible.

None (No Hunting): This selection disables hunting for the group. It allows a hunt group to be completely programmed yet disabled. Any intercom calls to this group will receive busy and line ringing ignores any programming within this group.

Station Hunting Timers

Call Advance Timer: This is the time interval that a station within a hunt group rings unanswered before the system routes the call to the next station in the group. This timer is programmable from 10 seconds though 5 minutes.

Overflow Timer: This is the maximum time interval that an unanswered call hunts within a group before the system routes it to the designated overflow station for the group. This timer is programmable from 30 seconds through 15 minutes.

Recall Timer: This is the maximum time interval that an unanswered transferred call hunts within a group before recalling to the source of the transfer. This timer is programmable from 30 seconds through 15 minutes.

Station Hunting Operation

When a system station user makes an intercom call to the hunt group pilot extension, the system rings the first available station within the hunt group (based on the group's selected hunting method). This ringing appears on the station's personal intercom. The system ignores all call announce settings as all intercom calls into a hunt group are treated as voice announce block calls. If the station does not answer the call within the programmed call advance time limit, the system rings the next station of the group. If no station answers within the programmed overflow time, the call rings the designated overflow destination.

When a line rings at a hunt group, it rings at the first available station within the group (based on the group's selected hunting method). As the ringing line appears at the station, it follows the DXP conventions for line appearances. If the station does not answer the call within the programmed call advance time limit, the system rings the next member station. If no station answers within the programmed overflow time, the system sends the call to the designated overflow destination.

The DXP supports a maximum of 64 hunt groups. Each hunt group can include the maximum number of stations that the system can support; however, due to system memory limitations, all hunt groups can not contain all stations simultaneously. Since the system makes a total of 32 Kbytes of memory available for station hunt groups, you can use the following formula to determine possible station hunt group capacities.

[32768 Kbytes] – [(Stations per group) x (2) + (220 bytes of memory)] = memory remaining for next hunt group

Station Message Detail Recording (SMDR)

Station message detail recording provides a record of the incoming and outgoing calls handled by the system on selected lines. This record provides information for accounting and traffic analysis studies. When enabled, SMDR is invoked automatically. The SMDR feature generates a call record for printing as soon as it is collected by the system. The call record is presented as ASCII data in an eighty-column format to an RS-232 data port located on the central processor unit circuit board. SMDR requires customer-provided equipment such as a printer or other compatible data recording device.

Also see the discussion titled *Call Costing and SMDA Reports.*

Station Monitoring With DSS Call Pick Up

Refer to the discussion titled *Intercom Number.*

Station Name

The installer can assign a display name and a full name to a station. A display name is composed of a maximum of seven characters and shows in the display of an LCD speakerphone as a identification aid. A full name is composed of a maximum of 20 characters and shows in some voice mail and open architecture interface applications. The installer can compose a valid name from any alpha-numeric character; however, the first character of a display name must be an alphabetic character.

Station Speed Dial

Station speed dialing is a feature that lets the user dial lengthy numbers using one or two buttons, store frequently used feature dialing codes, and store intercom extension numbers of frequently called telephones. The user can store speed dial numbers at any unused programmable button, or if the programmer assigns a shift button to a telephone, or one exists as a fixed feature button, the user can store a speed dial number at a second level under any programmable button.

Speed dial buttons can store up to 16 digits, plus, trunk or intercom number selection. Stored digits include 0-9, ✻ and #. A pause is stored at any point where the HOLD button is pressed, and a hookflash is stored at any point where the TAP button is pressed. Also refer to the discussion titled Automatic Pause Insertion.

There are two levels of storage on speed dial buttons. To access the second level, the user must press the programmed SHIFT button. The shift mode is then active for five seconds after the SHIFT button is pressed. If a SHIFT button is not available, the user has access to only one level of speed dial storage.

A speed dial set is a group of 10 speed dial locations. The DXP system allocates one speed dial set to each telephone as a default but can allocate up to 10 sets to a telephone if a programmer makes it so. When a DSS/BLF Console is operated as a companion to a telephone, the programmer must allocate it's speed dial sets at the companion telephone to be shared with the console. The total system speed dial allocation that is available is 960 sets or 9600 individual speed dial locations.

Station Transfer Recall

Refer to the discussion titled *Timed Recall.*

Subdued Off-Hook Voice Announce (SOHVA)

With the subdued off-hook voice announce (SOHVA) feature, a subdued announcement can be made from one station to another station that is off-hook and busy on a call. When a user is operating a telephone in a handsfree mode, it cannot receive a SOHVA. The telephone must be a model that includes SOHVA capability. With SOHVA, the announcement is delivered and responded to in a subdued manner that prevents the distant party from hearing either the announcement or the response. A tone alert precedes the announcement and is delivered to the handset receiver of the telephone ahead of the announcement. The installer can program the number of tones that the system delivers. The announcing callers also receive a tone to alert them that they are making a SOHVA call. Users can response to the announcement in a verbal or non-verbal manner. They affect a verbal response by pressing and holding the MUTE button or appropriate interactive button and speaking into the handset. They effect non-verbal response by pressing a pre-programmed button to send a message to be shown on the display of the announcing station (if it is an LCD speakerphone). The announcing station is automatically disconnected after the response message is displayed. Stations that have the voice announce blocking feature turned on cannot receive a SOHVA call. Also refer to the discussion titled *Call Announce with Handsfree Answerback* and *Response Messaging.*

SOHVA installations for analog telephones requires two paired station ports. In addition to the wiring connections associated with the installation, the installer must take certain programming actions. He or she must mark the telephone type for the odd-numbered station port to support the connected telephone, and mark the telephone type for the even-numbered station port undefined.

Busy On SOHVA

A default, a system returns a ring back tone to users who make SOHVA calls to busy stations; however, the system programmer can arrange for telephone users to receive a busy signal instead of the ring back tone. This feature lets non-LCD telephone users know that a called station is busy.

SOHVA Beeps (SOHVA Tone Bursts)

Installers can choose the number of tone bursts that each telephone user hears preceding a SOHVA message to be a value of from one to six.

Subdued Off-Hook Voice Announce Groups

The SOHVA calling groups control the pattern that station ports receive and/or originate SOHVA calls to one another. The programmer first creates SOHVA groups and then assigns individual stations to each group.

Subdued Ringing

When a station is busy on a call and another call comes to the same station, the ringing of the second call will automatically be subdued to a lower volume.

Synchronized Ringing

When the programmer enables synchronized ringing, the central office ringing pattern is tracked on external calls that ring within the DXP system.

Also refer to the discussion titled *Discriminating Ringing.*

System Clock

The system clock provides time and date information for display on LCD speakerphones and on SMDR/SMDA printouts. The clock also provides the time for the user–set alert feature.

System Speed Dial

System speed dialing provides system users with a repertory of up to 500 numbers that they can dial from any telephone in the system. The programmer or the attendant is responsible for storing the system speed dial numbers. These numbers can be up to 32 digits long and can include line number selection, the dial pad digits 0-9, ✻, and #, Plus pauses and hookflash signals.

The programmer or attendant can divide the unused or available system speed dial numbers into up to 50 different groups with 10 numbers in each group and then assign different speed dial groups to each station class of service (total of 500).

The program can choose a line a line group that the system will automatically select for speed dialing. Alternately, the programmer or attendant can choose the intercom to be automatically selected for speed dialing. This enhancement allows an intercom selection and feature codes to be stored together as speed dial numbers for true one-button access to features (for example; store INTERCOM ✻11 and INTERCOM #1 at two locations for system wide availability to music on and music off). This enhancement will not accept ✻#0✻ or ✻#746✻ as programming entries and it ignores any entered pauses or hookflashes.

System Status And T1 Status Log Viewing

When enabled, this feature permits the system to notify certain designated stations when a system error condition occurs by lighting the system status button. You can view the status log directly from an LCD speakerphone. If the T1 option is installed, you can also view the T1 status log from an LCD speakerphone in the same manner.

Your LCD speakerphone must have a pre-programmed system status button to enter the status log viewing mode. The status button is programmed using the button mapping procedure in the Programming Instructions. The LCD status log viewing feature allows you to view the log only. The installer must use programming to clear the log.

To enter the log viewing mode, you press the system status button (the system status button flashes red if any log entries exist). The LCD indicates **SYSTEM** and **T1** (if the T1 option is installed). Select the log you want to view by pressing the related interactive button. If you are using a telephone that is not equipped with interactive buttons, you can use dial pad buttons 1, 2, and 3 that perform the same functions as the interactive buttons. See the following chart.

Interactive Button Location	Displayed Function	Equivalent Dial Pad Button
Left	SYSTEM,	1
Left	REV	1
Center	FWD	2
Right,	T1	3
Right,	INFO	3

After selecting the log you want to view, you can view the time and date of the current log entry by pressing the INFO interactive button (or dial pad button 3 when appropriate). You can scroll through the selected log to view all of the entries by pressing the REV and FWD interactive buttons (or dial pad buttons 1 and 2 when appropriate).

The number of entries in the log is displayed whenever you press the # button.

You exit the log viewing mode either by pressing the SPEAKER button, pressing the hookswitch, or waiting for the 15-second timeout.

T

T1 Digital Carrier Transmission Option

This feature allows up to 24 channels of voice and/or data transmissions over a single four-wire cable using multiplexing techniques in superframe (SF) or extended superframe (ESF) format. For convenience, a customer service unit (CSU) is built into the T1 option board to terminate the T1 channels, provide protection from transient voltages, and respond to loopback requests from the central office. This eliminates the need to install a CSU external to the DXP.

Up to four T1 boards can be installed if the expansion cabinet has been added to the main cabinet – two boards in each cabinet. The DXOPT-SYN card on the DXAUX board must be installed whenever one or more T1 boards is installed, and the DXP is receiving its timing signals from an external source. In installations where the local DXP is supplying the clock signal for the far system, no DXOPT-SYN card is required in the local DXP.

You can assign a system status button to a station and enable the system to report T1 transmission errors via the T1 status log. Depending on how you program the system, the T1 status log either prints out on an optional printer or is displayed on an optional video display terminal (VDT). You can also view the T1 status log from an LCD speakerphone by programming a system status button.

Also, you can program the system to alert the system attendant whenever a major alarm alerting condition occurs by activating an external, customer-supplied audible or visual alarm. The external alarm connects to one of the relay jacks (J3 or J4) on the front of the DXCPU board. Make sure the alarming device complies with system voltage and power requirements. You determine when a major alarm alerting condition should occur by programming threshold values and corresponding time periods for each type of alarm caused by a transmission error. Whenever the threshold value is reached within the programmed time period, the selected relay on the DXCPU board is activated by the board's circuits, which in turn, activates the external alarm. The system attendant can turn the alarm off from any specified station by dialing a feature code.

Transmit Or Receive Gain

Line transmit or receive gain adjusts the audio levels for both the transmit and receive circuits in the individual T1 channels when using the T1 option. The available selections are very low (-6 dB), low (-3 dB), normal (0 dB), high (+3 dB) and very high (+6 dB). The default setting is "Normal (0 dB)."

Adjusting the receive level changes the strength of the incoming signal while adjusting the transmit level changes the signal strength being received at the far end.

CAUTION

If you use line transmit or receive gain on non-T1 lines, it can severely affect speakerphone performance.

TAP (Flash)/Recall

When host system custom calling features are available via a hook-flash signal while on line, the TAP button functions as a hook-flash button and generates a flash signal when the user presses it. When custom calling signals are not available, the TAP button functions as a positive disconnect and recalls dial tone when the user presses it. These features are mutually exclusive. The programmer sets the desired function for the system by programming action. With single–line proprietary telephones, the Tap function works for internal transferring only. An access code is required to activate custom calling features

Telephony Services Application Programming Interface (TSAPI) Support

The DXP provides support for TSAPI applications. These applications are Novell Telephony Services* applications developed by third-party software vendors. TSAPI applications run independently of the DXP yet use its digital communications capability. The DXP' Enterprise open architecture interface (OAI) data port provides the hardware interface for the personal computer (PC) that runs the TSAPI software program. Depending upon the TSAPI application and its functions, there may or may not be a need to reprogram the DXP database feature parameters.

*Novell, Novell Netware, and Novell Telephony Services are registered trademarks of Novell Inc. Orem, UT

Through Dialing

An installer can connect external telephony equipment to the DXP through a proprietary interface device or through an IST port. When the programmer enables the through dialing feature, DTMF tones that the external device generates pass through the interface equipment, the DXP system, and any line connection. Also see the paragraph titled *Off Premise Extension*

Time And Date

The time designation will accept either a 12- or 24-hour format. Time and date appear on the LCD speakerphone and the SMDA/SMDR record printout.

Timed And Immediate Recall

If a telephone user places a call on hold and fails to pick it back up within a preprogrammed time, the call rings the user's telephone again. While only the telephone that put the call on hold rings, all other telephones that share call appearance will flash the light for the held call at a hold recall rate.

Recall to an originating station also occurs from unanswered parked calls, transferred calls, and calls that are camped-on. Plus, unanswered calls (ring no-answer calls) recall to the attendant or other preprogrammed designation after exceeding a preprogrammed timeout period.

Any transfer attempt that fails will cause the held call to recall immediately. Examples of failed transfer attempts are calling any of the following:

–non-existent extension

–partial extension number

–invalid extension number

A calling party continues to hear music on hold (if provided) throughout the recall sequence.

Toll Restriction

With the toll restriction feature, the system allows or denies outgoing line calls to selected users over selected lines. Toll restriction meets different dialing needs by allowing users to dial numbers that they are required to dial yet restrict them from dialing numbers they are not allowed to dial. Toll restriction can be used together with the automatic route selection and call costing features if desired, or used separately as a stand alone feature or not used at all.

The programmer assigns toll restriction to stations based on system requirements. Telephones that are not assigned this feature are free to dial any number their users choose to dial. Plus, a toll restricted station can dial any telephone number that it is not restricted from dialing. If a station is restricted from dialing a certain telephone number on a certain line, it can, if programming permits, dial that number on another line that is not restricted. Further programming action specifies whether or not toll restriction applies to system speed dial numbers. The programmer can also differentiate between day toll restrictions and toll restrictions that only take effect in night mode. A defaulted system imposes no toll restriction on any station.

The toll restriction feature first compares a dialed number to a matching assigned restricted number up to the last digit in the assigned number. At that point it considers it a match and applies other toll restriction tests whether the station user keeps dialing or not. If all toll restriction tests are met, the station is not normally allowed to dial the number. There are 32 exception number test matches assigned to the station. Exception numbers allow stations to dial numbers that they are not normally allowed to dial by their toll restriction.

Toll Restriction Pause Entries

When this feature is activated by installers, they can enter a pause at the end of a restricted number's digit string to indicate that dialing is complete. They do this by typing a P or p after they type the digit string. The pause entry distinguishes this restricted number as unique. They can enter the same digits without the pause but instead followed by additional digits as another unique number. They can assign different routing and toll restriction parameters to each of these entries. There are several applications for this feature. One application is in international dialing where different toll restriction parameters apply depending upon whether the caller dialed 0 or 011. In this case, installers can enter 0 pause to access local lines and 01 to access international lines. Another application is with tie line calling where a remote extension is the same digits as an office or area code that installers need to enter in the restriction table. By entering nnn pause for tie line access and nnn@ for CO line access, the system can route the call over the proper line. A third application is brought forth with the advent of the new North American Numbering Plan (NANP). With NANP, an area code may be the same digits as a local office code. Installers can enter nnn@@@@ **pause** for local line access and nnn@@@@@@@ for long distance line access (the @ is a match anything character). In any application, the system resets its pause timer after receiving each caller dialed digit. If the timer expires before the caller dials another digit, the system routes the call based on the digits preceding the **pause**. If, instead, the system detects more digits instead of a **pause**, it routes the call based on the entire digit string.

Tone On Hold

This feature gives you an alternative to providing music or no music for callers who are placed on hold.

When you program this feature into the DXP system, both internal and external callers hear a pattern of short tone bursts while they are on hold. The patterns consist of two 1/10-second tone bursts separated by 1/10-second. These tone patterns repeat every five seconds.

The installer enables this feature and assigns it to particular trunks through line programming or stations through class of service programming using the PC. The system manager can also select this feature from the applicable class of service from a programming station for intercom calls placed on hold. The choices when programming this feature are: music from source one, music from source 2, tone on hold, or nothing.

Tone Or Voice Signaling On Internal Calls

Intercom number calls can be tone signaled or voice signaled as desired. Programming determines which signaling method the system uses as the primary method when an intercom number call is made. Users can choose the alternate method at the station by pressing the intercom key. Intercom number call progress is marked by special tone signals.

Tracker Paging System

The Tracker Paging System interfaces a DXP system with individual Tracker pagers. The Tracker Paging System informs users through their Tracker pagers that they have a call waiting for them. The Tracker base station connects to any of the DXP system's serial ports or to the PC Attendant position. The DXP can accept up to four Tracker base stations supporting up to 600 Tracker pagers. Many different types of Tracker pagers are supported—from those with numeric displays to those that display a pre-programmed message up to 32 alphanumeric characters long.

Creating Messages From The PC Attendant

Up to eight default messages can be programmed and delivered exclusively from the PC Attendant position (see the *Digital Communications System PC Attendant's Console User's Guide*, GCA 70-230 for instructions). The PC attendant can be in either the *local* or the *system* mode of operation.

RNA Or Busy Tracking

If the called station fails to answer or is busy, the caller can activate the Tracker Paging System by pressing the TRACK button on his or her telephone. The TRACK button is one of the telephone's interactive buttons. On telephones not equipped with interactive buttons, the caller activates the Tracker Paging System by dialing the Tracker access code (defaults to * 8). When the call is accepted, the caller will hear a confirmation tone, or if it is not accepted, a busy tone.

Direct Tracking

The caller can also do direct paging by pressing the TRACK programmed button or by dialing the Tracker access code (defaults to * 8). The telephone prompts the caller with its display to enter the assigned extension number for the pager along with the display message "Enter Ext:"

Transfer Tracking

If the system attendant attempts to transfer a call to an extension that does not answer (or is busy) and then activates the Tracker pager assigned to that extension, the incoming call is placed on a page orbit. Once the system places the call on a page orbit, the user's Tracker pager displays the orbit number so that he or she can retrieve the call by dialing the number of the orbit containing the call. If the user does not retrieve the call within the pre-programmed timeout, the call returns to the attendant. The Tracker Paging System on DXP supports up to 100 page orbits.

Using Voice Mail With Tracking

When a caller reaches an extension with an assigned Tracker pager, and that extension is covered by proprietary voice mail, the system may prompt the caller to either select the assigned Tracker pager or leave a message. If the caller selects the Tracker pager, the system places the call in a page orbit, and displays that page orbit number on the user's Tracker pager. The user retrieves the call by dialing the number of the page orbit containing the call. After a pre-programmed timeout, the call is returned to the proprietary voice mail where the caller can leave a message.

Accessing The Tracker Pager From DISA

The Tracker Paging System is accessible from DISA by using the DVA voice messages.

Programming Options

There are three levels of programming associated with Tracker operation.

One level, the DXP system level, is done by the installer or system programmer using a PC. This installs Tracker operating parameters and pager-to-intercom assignments that can only be changed at this programming level. Transfer/Conference Button

Each multiline telephone and proprietary multiline telephone provides a fixed button that gives quick, easy transferring and conferencing of calls.

Another level is done by the PC attendant, if installed. The PC attendant operates in one of two modes–*local* or *system*. In the local mode, the attendant can assign pagers to intercoms and select pager types. This programming is transparent to the DXP system and does not alter any Tracker programming done at the DXP system level. In the system mode of operation, all Tracker operating parameters and pager-to-intercom assignments, as viewed on the PC screen, are as programmed into the DXP system by the installer or system programmer.

Finally, the system manager can select a Tracker base station and enable or disable the Tracker Paging system from a programming station.

Transfer Recall

Refer to the discussion titled *Timed Recall.*

Transfer Ring Cadence

A telephone user can select the ringing cadence that announces a transferred line call. They have two choices as follows: one cadence provides a 2 sec. on—4 sec. off tone, the other cadence provides a 0.5 sec on—5.5 sec. off tone. The programmer can choose either cadence as the default setting.

U

Unscreened Call Transfer

Refer to the discussion titled, *Call Transfer - Unscreened With Automatic Camp-On.*

Unsupervised Conference

Refer to the discussion titled *Conferencing - Multiline.*

V

Voice Mail Integration Digits

Installers can choose the DTMF digits that the DXP sends to a voice mail system. A voice mail system uses these DTMF digits to determine system and station status so that it can properly process a call. Installers must be versed in the voice mail's requirements before they can assign DTMF integration digits in the DXP. The system defaults the voice mail parameters to match the Comdial voice mail system. Certain applications in countries with dialing plans different than the United States may require different integration digits. The default digits are shown in the following list and discussed below:

Follow Extension ID = 2	Intercom/Answer Confirmation = 1
Busy = 2	Do Not Disturb = 3
Incoming Intercom Answer = 9	Disconnect = A

Follow Extension ID – When the voice mail system receives a forwarded call from a ring no-answer (RNA) or busy station, the DXP sends to the voice mail system the extension number of the forwarded call followed by this DTMF digit (n). The DXP sends this digit within 500 ms of the time the voice mail system answers the call. For example, if extension 101 is forwarded to voice mail and voice mail answers a forward RNA or busy forwarded call, the DXP sends 101n to the voice mail system within 500 ms of the answer time.

Intercom/Answer Confirmation – The DXP sends this DTMF digit to the voice mail system to confirm that an intercom path (without dial tone) is available for the voice mail system's call transfer or dialing use. The DXP sends this digit within 500 ms of the time it detects the voice mail system's off-hook or hookflash condition. The DXP also immediately sends this digit to the voice mail system when a station answers a voice mail transferred call. This action can alert the voice mail system to disconnect and leave the parties connected.

Busy – If the voice mail system transfers a call to a station that is busy on a call, the DXP sends this DTMF digit to the voice system. When the voice mail system receives this digit, it can abandon the transfer, reconnect to the call, and offer the caller whatever options the the voice mail system has available in its programming. If the DXP auto attendant transfer on busy feature is active, the DXP will not send the DTMF digit to the voice mail system thus allowing the system to transfer a second call to the station.

DND – If the voice mail system transfers a call to a station that is in the do not disturb (DND) mode, the DXP sends this DTMF digit to the voice system. Receiving this digit allows the voice mail system to distinguish between a busy and a DND condition and offer the caller the appropriate choices.

Incoming Intercom Answer – The DXP sends this DTMF digit to the voice mail system when a station user makes an intercom call to the voice mail system. This action allows the voice mail system to distinguish between internal and external calls and offer the caller appropriate prompts and dialing options.

Disconnect – When an outside line or intercom party hangs up, the DXP sends this DTMF digit to the voice mail system to command an immediate disconnect. For outside calls, the central office (CO) must provide disconnect supervision to the DXP and the installer must program the DXP line for abandon hold release and disconnect supervision. At default, the DXP sends the DTMF tone for the A character as the disconnect digit. Since a caller cannot dial an A from a telephone. This feature eliminates callers from causing an accidental disconnect by dialing this digit on their telephone's dial pad.

Voice Announce Blocking

This feature allows the user of multiline telephones to block voice announced intercom calls by dialing a special code or by pressing a programmed button.

Z

Zone Paging

This feature arranges for stations to transmit and/or receive voice announcements to and from a particular group of stations or to all stations. This feature also arranges for all-call and zone paging to an external paging device. The programmer can assign stations to particular paging zones, up to eight zones, to permit station users to make announcements to one particular site, or he or she can assign all stations to the same zone to permit users to announce all areas at once.

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Installing The DXP Main Common Equipment Cabinet

1.0 Installing The Common Equipment Cabinet

1.1 Considering The Mounting Parameters

- Choose a suitable location.

  ✔ A suitable location is within four feet of a proper electrical outlet. (The main cabinet and two expansion cabinets requires two dedicated 117VAC 15 AMP circuits, with a third-wire ground, supplied to standard NEMA 5-15R electrical outlets. Each outlet must be supplied from the opposite phase of the AC power line.

  ✔ A suitable location provides a distance between the common equipment and the TELCO/PBX jacks of 25 feet or less as per FCC requirements. (Good engineering practices recommend a nominal distance of 7 feet.)

  ✔ A suitable location allows enough room between the top and bottom of the main cabinet and the ceiling or floor of the equipment room for placement of one expansion cabinet above and one expansion cabinet below the main cabinet.

  ✔ A suitable location is secure and dry and has adequate ventilation. The temperature range of a suitable location is within 32–122 degrees F (0-50 degrees C), and the relative humidity is less than 90 percent non-condensing .

1.2 Inventorying The Tools And Hardware

- Round-head wood screws (typically $^1/_4$ x 1–inch for mounting equipment cabinet to backboard)
- Round-head wood screws (typically $^1/_4$ x 1 $^1/_2$–inch for mounting backboard to wall studs; longer screws are necessary if fasteners must also pass through a dry-wall covering)
- Cross recessed screwdriver (phillips-head type)—to match front panel shipping screws
- Flat blade screwdriver—to match front panel retaining screws
- Electric drill—if prepared holes are required
- Connecting tool—for fastening wires to a type–66 connector block.
- Crimping tool—for 623-type modular plugs
- Static discharge wrist strap and conductive floor mat

1.3 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein.
The information contained herein does not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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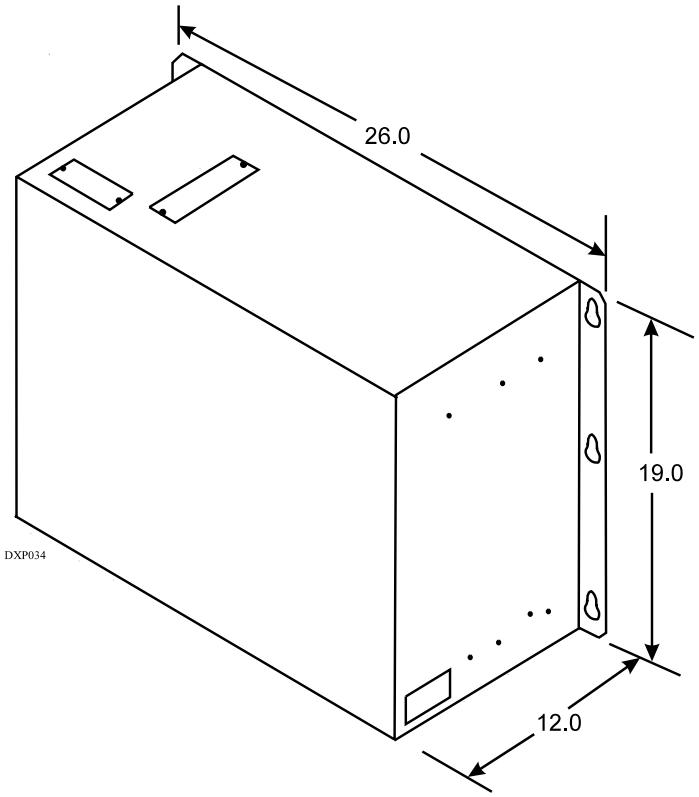
1.4 Mounting The Common Equipment Cabinet

1. Unpack and carefully inspect all equipment for shipping damage. Notify the shipper immediately of any damages found. Verify that the packages contain all parts and accessories needed for proper installation and operation.
2. Choose a place at the mounting location where the backboard will bridge underlying wall studs, and securely attach a suitable backboard to the mounting surface. (Suitable backboards are available commercially or you can construct one out of 3/4-inch plywood.) You must drive the hardware that secures the backboard to the mounting surface into the underlying wall studs instead of just into the wall material alone.
3. Refer to the illustration for the locating dimensions required for the mounting screws, and mark their locations on the backboard. You must attach the main common equipment cabinet vertically to the backboard.
4. Drill holes in the backboard of a proper size to accommodate the hardware being used.
5. Insert the two top screws into the backboard and tighten them to within approximately 1/8-inch of the surface.
6. Hang the cabinet on the top screws using the top mounting holes in the rear mounting flange of the cabinet. Note that these holes are elongated with an enlargement at one end. This feature allows the cabinet to slide down on the screws to secure the mounting when the cabinet is hung on them.
7. Use the openings for the middle and lower set of mounting screws as a guide, and mark the location for the remaining screws.
8. Lift the cabinet from the top screws and set it aside while preparing the holes for the remaining screws.
9. Rehang the cabinet as discussed in step 6.
10. Insert the middle and lower screws into the backboard and tighten them to within approximately 1/8-inch of the surface.

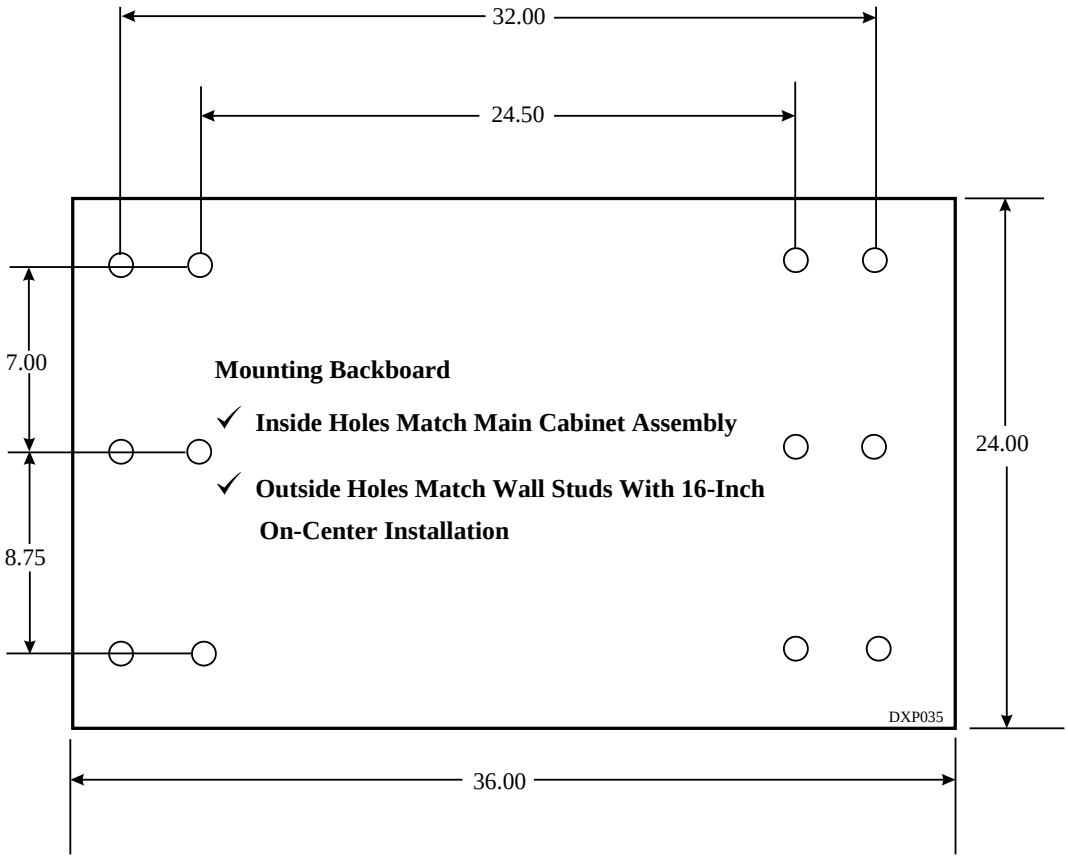
Shipping screws attach the front panel to the main cabinet. These screws are in addition to the two retaining screws located at the lower corners of the panel. Remove and store the shipping screws. You will not need them to re-attach the panel to the cabinet after you have installed the power supply assembly, circuit boards, and wiring; however, you will need them to secure the panel in place if you should later transport the cabinet to a new location.

After you remove the screws, pivot the front panel upward until you can unhook the panel hangers from the slots in the cabinet top. To re-attach the front panel, pivot it upward so that you can hook the panel hangers into the slots at the top of the cabinet, and then pivot the panel down in place. Install the two retaining screws at the bottom right-hand and left-hand corners of the panel to secure it to the cabinet.

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Detailing The Cabinet Dimensions



Mounting The Common Equipment Cabinet

1.5 Understanding System Grounding Requirements

Transient voltage spikes, if induced onto CO or CENTREX lines, can travel through the cable and into the common equipment. The telephone company offers basic protection against this condition but it is usually designed to protect the central office circuits. While it will also provide some protection to the common equipment, you should not rely upon it for total protection. To help ensure that external over-voltage surges do not damage the system, you should install and properly ground primary protection devices, such as gas discharge tubes or similar devices, on all lines. While the line boards have internal secondary surge protection on all line ports, in order for this protection to be effective, you **MUST** connect the common equipment cabinet to a reliable, effective earth ground.

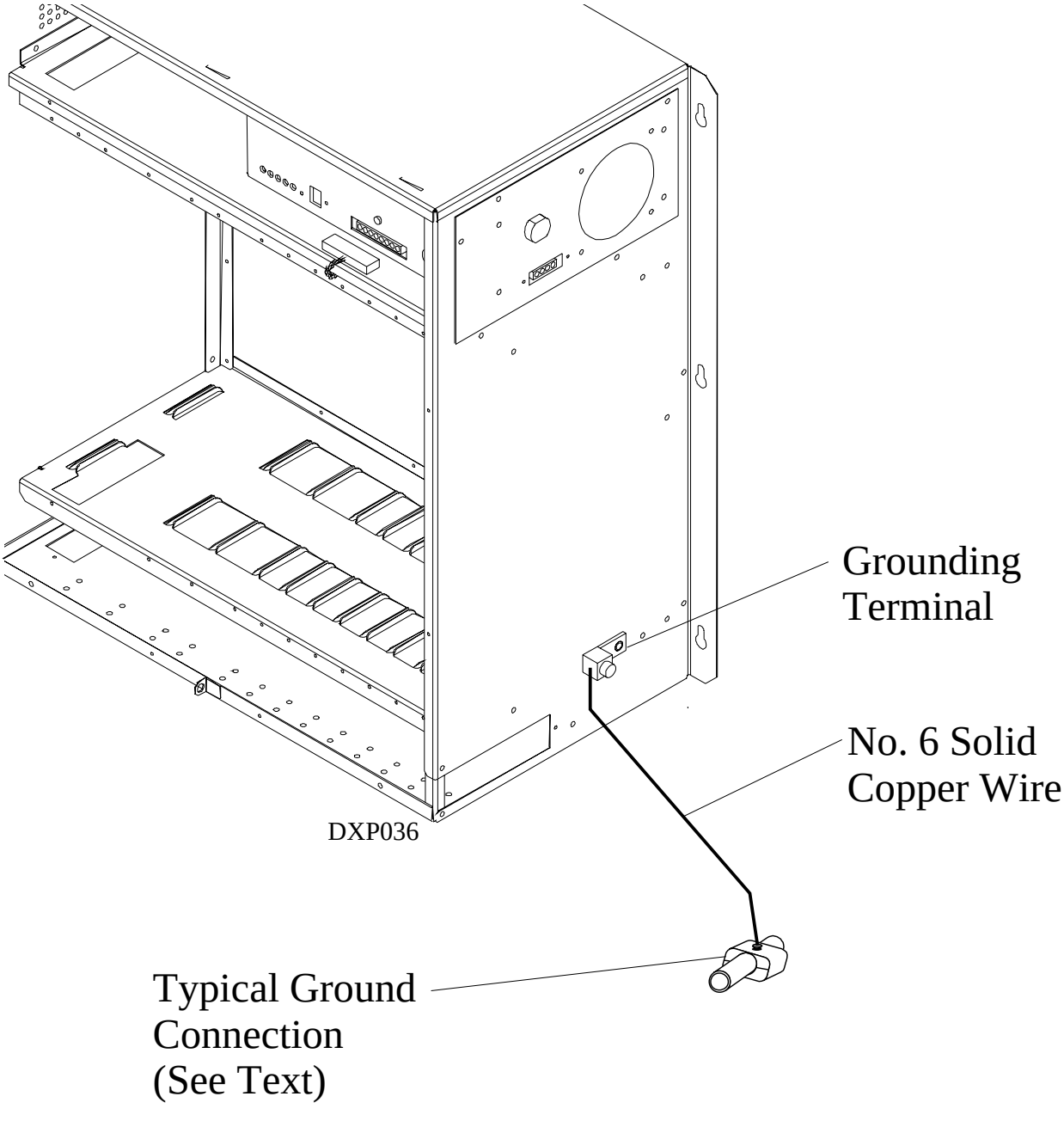
Proper DXP grounding is necessary for trouble-free operation and personnel safety. The DXP has the following three types of grounds:

- Service Ground—a neutral power line wire that is connected to the ground bus in the premises' AC power panel,
- System Ground—a non-current carrying power line wire that is connected to the ground bus in the premises' AC power panel,
- Frame Ground—a low impedance conductor that places the common equipment cabinet at reference ground potential. The frame ground provides the greatest safety by limiting electrical potential between non-current carrying parts of the system. The common equipment cabinet provides a ground stud on its cabinet for access to its frame ground.

Effective grounding requires that you connect the frame ground to a good earth ground. A good earth ground is one such as the ground bus in the premises' AC power panel or a public metallic cold water pipe at a point immediately at its entrance to the premises and ahead of any meters, pumps, or insulating sections that have been added for vibration reduction. Avoid using the premises' structural steel frame as it may not be at earth ground potential. Make the ground connection with #6 or larger insulated, solid copper grounding wire. **Keep the ground wire separate from the three-wire AC line cord, do not splice it, and keep it as short as possible.**

The impedance of the wiring between the DXP and the earth ground must not exceed 0.25 ohms and the impedance between the earth ground and the power company's reference standard ground must not exceed 5 ohms. Use an acceptable low impedance measuring device to measure the impedance of these paths. The #6 or larger wire size will minimize the wiring impedance; however, if the impedance between earth ground and the power company's standard reference ground exceeds 5 ohms, contact the local power company. The ground path must always be of sufficient current-carrying capacity to prevent a build up of voltages that may result in circuit noise, hazard to personnel, or equipment damage.

Be sure that all of the ground connections are visible for inspection and maintenance. Tag all of the ground connections with a sign that reads: *Do Not Remove Or Disconnect*.



Grounding The System

2.0 Installing The Power Supply

NOTE: The common equipment cabinet employs an electronic switching power supply. During operation, power supplies of this type generate an audible sound from their switching regulators. This sound is normal and is not an indication that the power supply is operating improperly.

Install the power supply assembly in the common equipment cabinet per the following discussion and illustration.

1. Be sure to ground the common equipment cabinet per the instructions in the previous paragraph before installing the power supply assembly.
2. Remove the power supply assembly from the carton. Be sure to save the small bag containing the mounting hardware.
3. Slide the power supply assembly into the opening at the left side of the common equipment main cabinet and lower the front mounting holes over the threaded studs protruding up from the cabinet frame.
4. Route the power cable from behind the power supply assembly to the connector on the backplane and connect it there.
5. Remove the two #8-32 hex nuts and lockwashers from the bag and install them on the threaded studs to secure the power supply assembly in place. Be sure to tighten the screws securely.
6. Remove one #6 machine screw from the bag and thread it through the tab at the rear of the power supply assembly into to standoff located on the back of the cabinet.
7. Route the AC line cord through the square opening in the side of the cabinet.

CAUTION

DO NOT attach or secure the line cord to the surface of the mounting location in any manner.

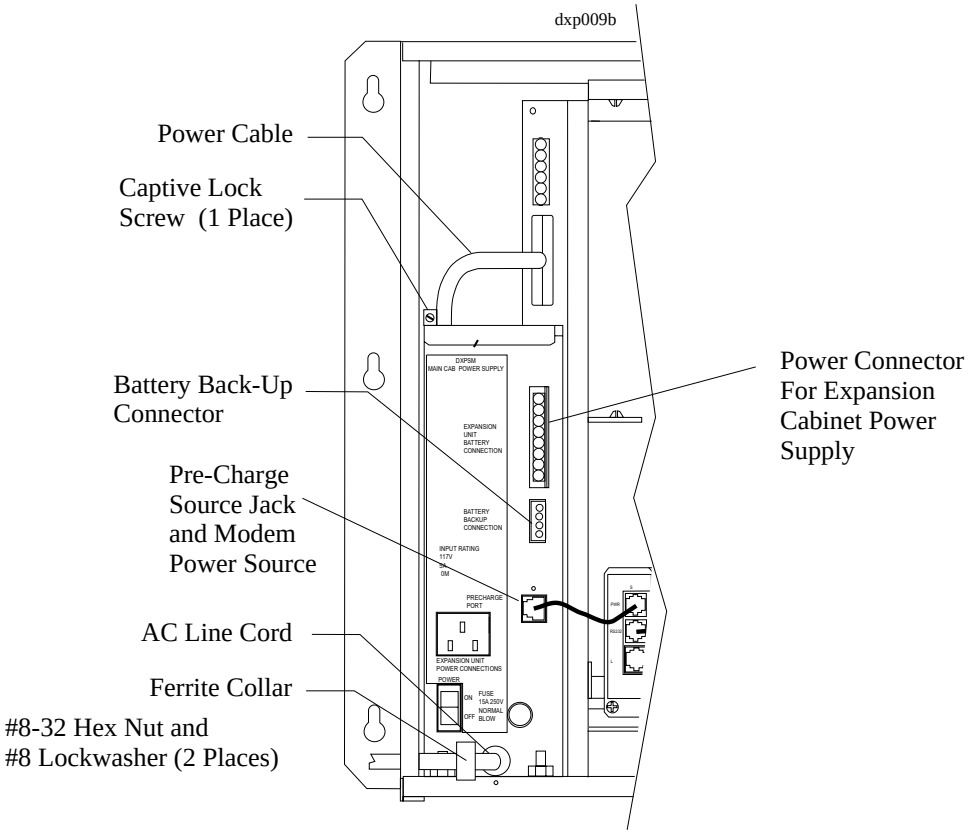
8. A ferrite collar is included with the power supply assembly. Snap this collar around the AC power cord to provide protection against radio frequency interference.

2.1 Making The AC Power Connection

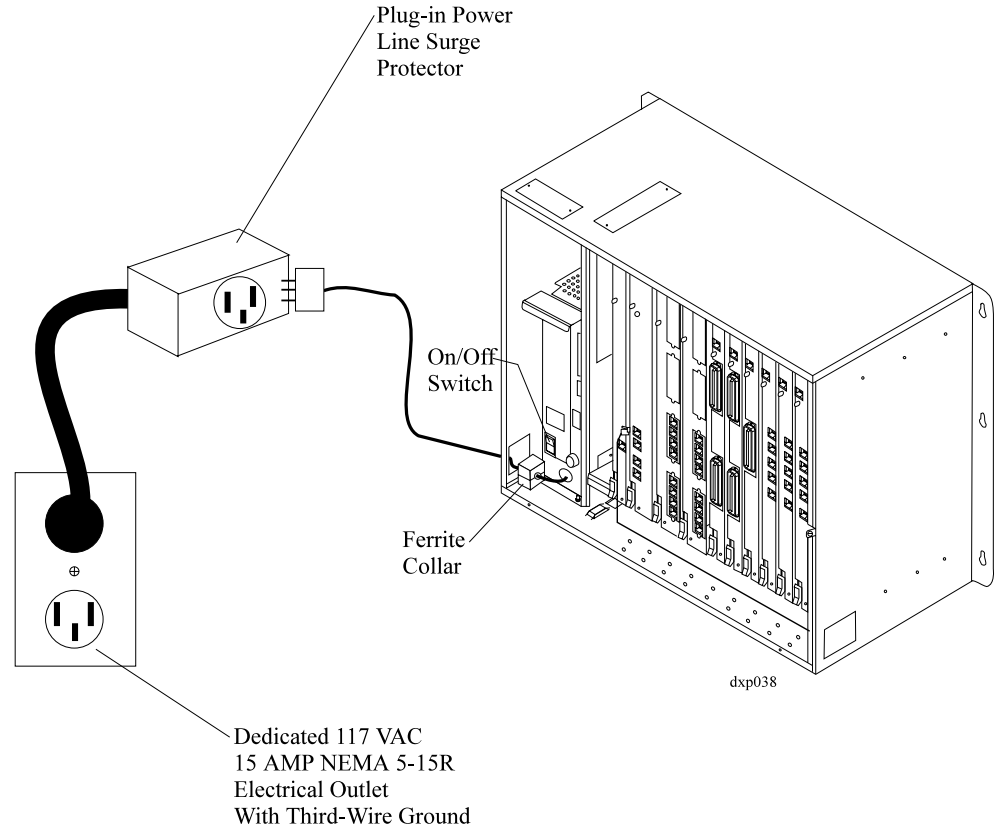
- For the main cabinet's AC power connection, employ a dedicated 117 VAC 15 AMP circuit, with a third-wire ground, supplied to a standard electrical outlet (NEMA 5-15R). Remember, this electrical outlet must be located within four feet of the common equipment cabinet.
- To provide protection against surges and spikes that may appear on the AC line, install a plug-in power line surge protector between the AC power cord of the installed equipment and the AC outlet..

CAUTION

DO NOT attach or secure the line cord to the surface of the mounting location in any manner.



Installing The Power Supply



Making The AC Power Connections

2.2 Measuring The Power Supply Voltages

If you need to measure power supply voltages, you can do so at the DC voltage connector. Measure the power under the following conditions:

- AC line cord connected to the AC outlet,
- DC power cable disconnected from power supply's DC voltage connector,

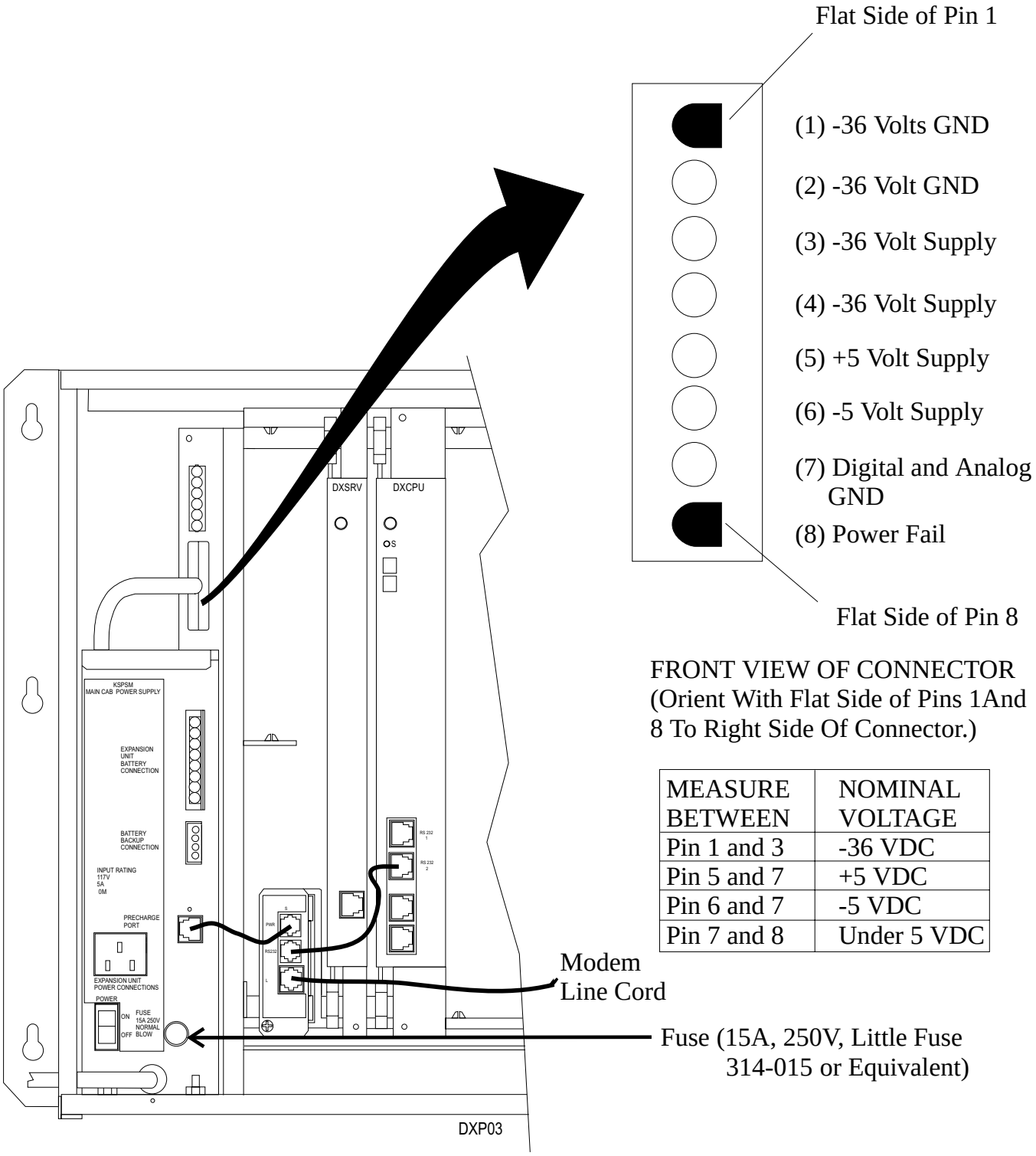
Measurement details are shown in the illustration.

CAUTION

Once you have measured the power supply voltages, turn off the AC power switch and disconnect the AC line cord from the AC outlet. Leave the AC power disconnected until you have installed the circuit boards in the main cabinet.

2.3 Identifying The Fuse

The power supply fuse is a slow-blow type rated at 15 AMPS and 250 VOLTS. A replacement fuse must have the same rating.



FRONT VIEW OF CONNECTOR (Orient With Flat Side of Pins 1And 8 To Right Side Of Connector.)

MEASURE BETWEEN	NOMINAL VOLTAGE
Pin 1 and 3	-36 VDC
Pin 5 and 7	+5 VDC
Pin 6 and 7	-5 VDC
Pin 7 and 8	Under 5 VDC

Measuring The Power Supply Voltages

3.0 Installing Circuit Boards In The Main Cabinet

CAUTION

Circuit boards for the DXP system are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, for general information. Specific handling precautions are also included in this installation instruction.

Each circuit board is supplied in a static protection bag. Do not open a static protection bag prior to board installation time.

The board slots are keyed so that only those boards that will operate from a particular slot will plug into that slot.

The main cabinet provides unique slots for the CPU board, the services board, and the interface board for the main cabinet, universal slots that accept auxiliary boards, line boards, or station boards, and dedicated slots for line boards alone.

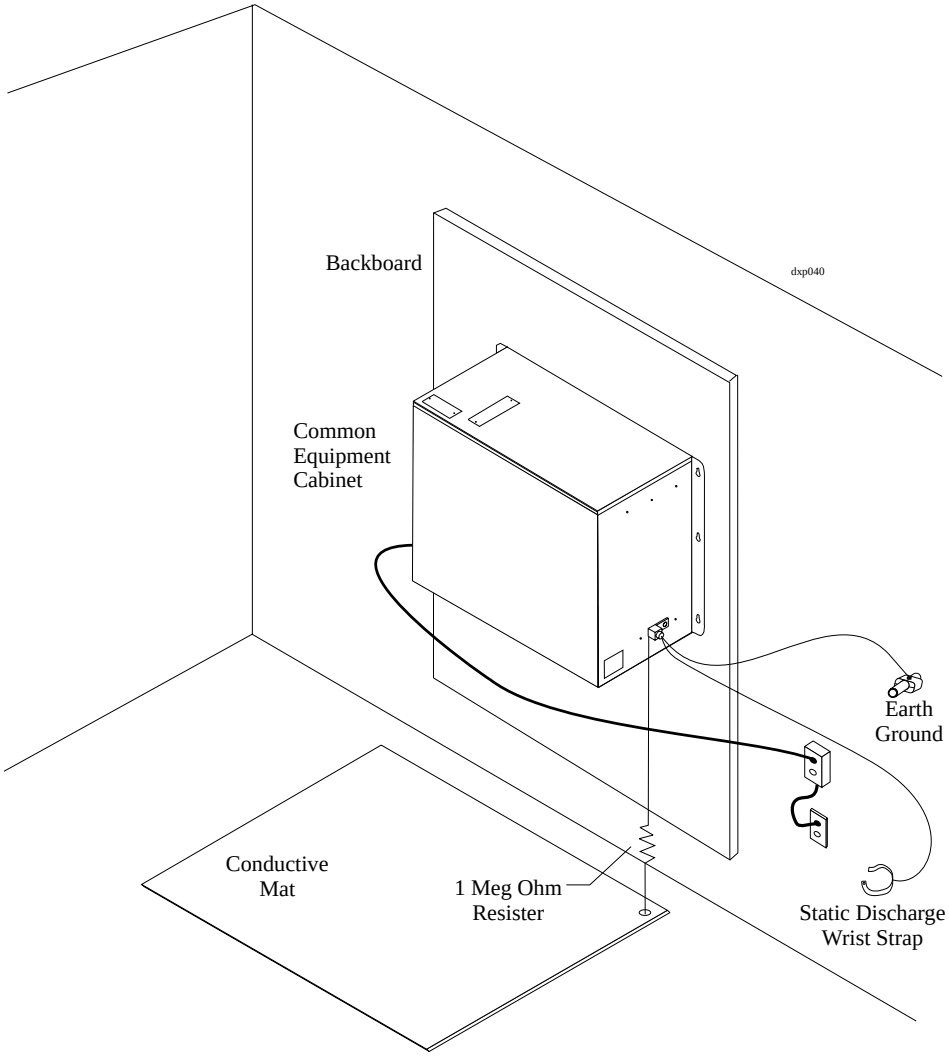
This publication provides installation instructions for the CPU and services boards. Since you will install line and station boards as well as auxiliary boards and other optional circuit boards on an as needed basis, each of these boards include its own installation instruction for your reference.

3.1 Creating A Static Safe Work Area

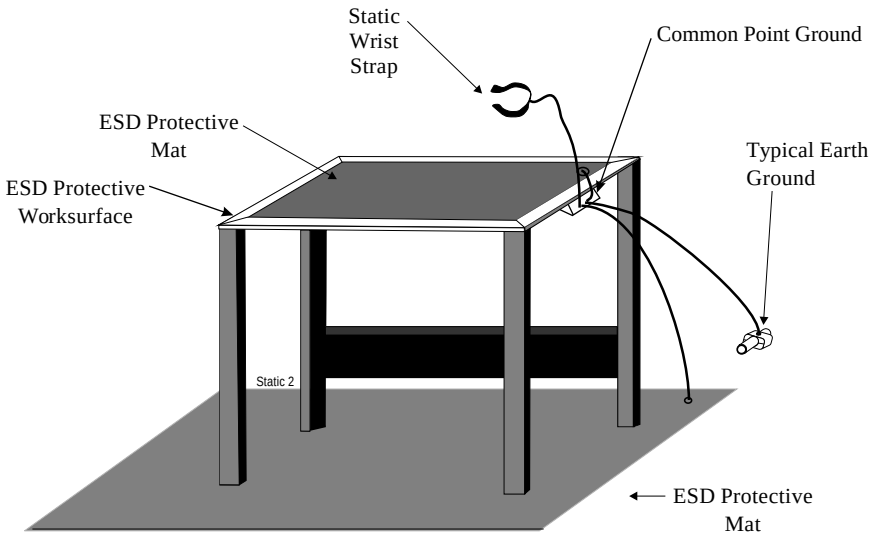
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



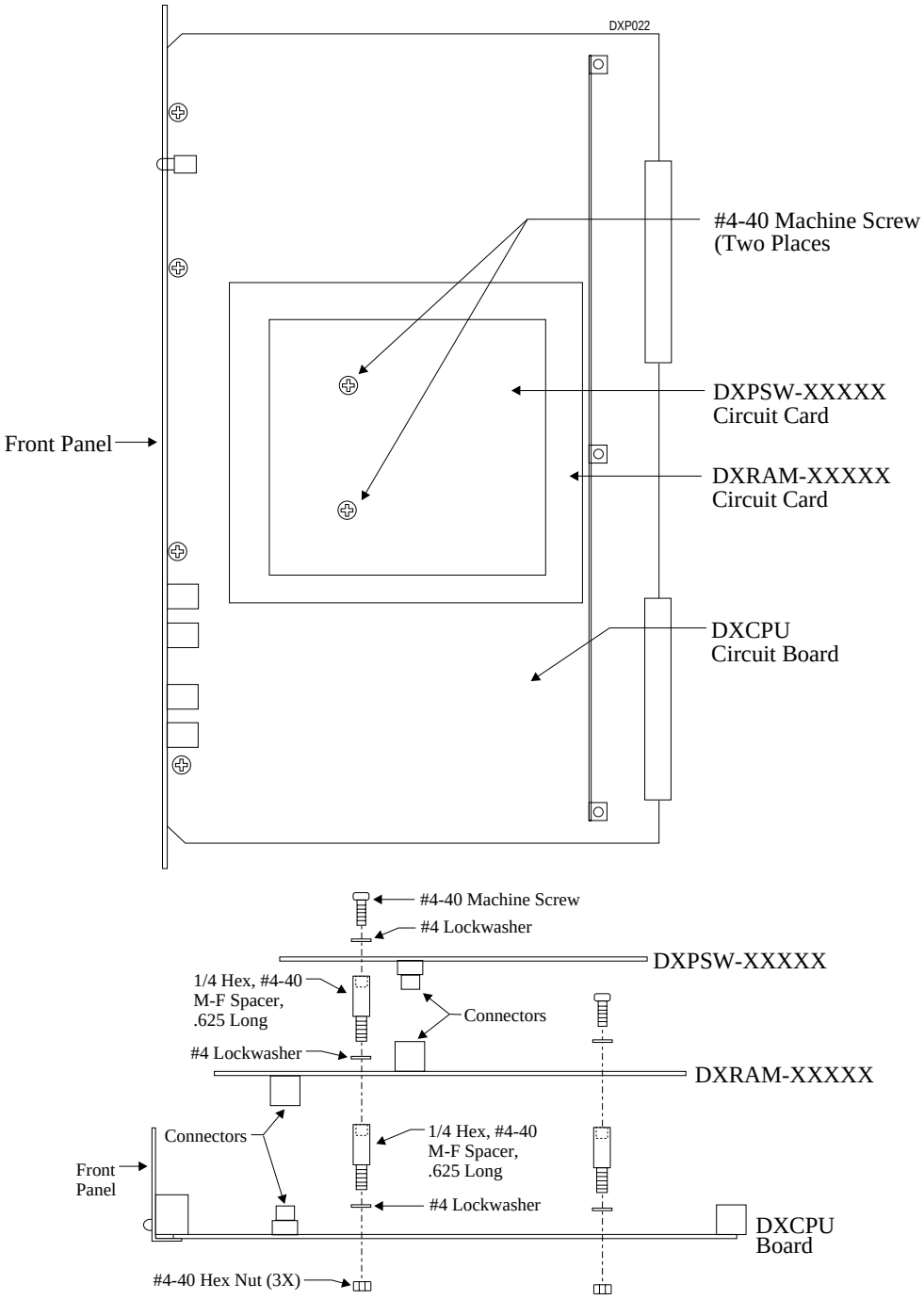
Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

3.2 Installing The RAM Memory Card, System Software Card, And CPU Board

1. Place the static protection bags that contain the CPU board, the RAM card, and the system software card on the static safe work area.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground.
3. Remove the CPU board, RAM card, and system software card from their static protection bags, orient them as shown in the illustration, and attach them with the supplied hardware.



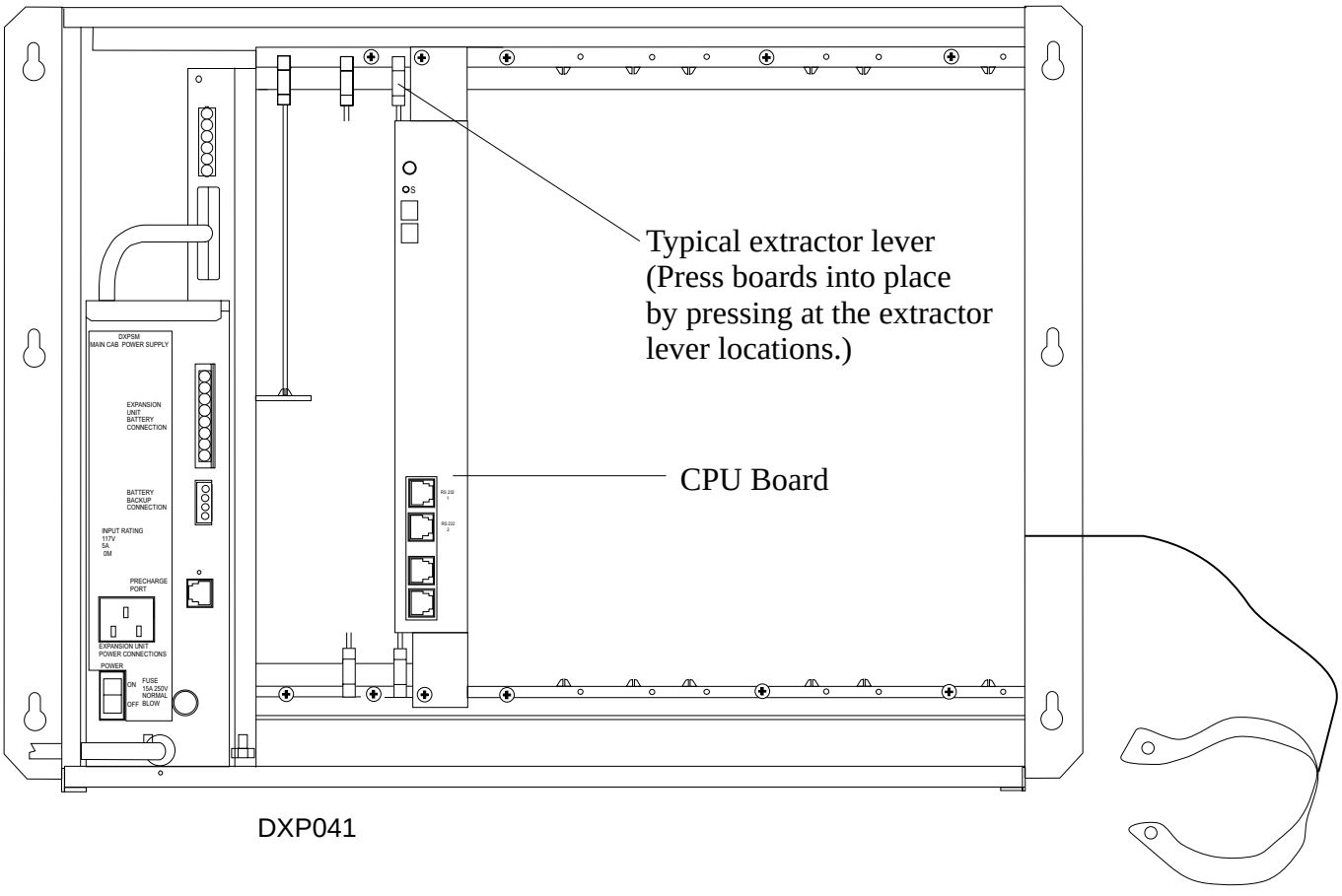
Assembling The Software Board To The CPU Board

4. If the common equipment cabinet is not at the static safe work area, place the assembled CPU board and software card into a static protection bag and transport the board assembly to the cabinet.
5. Be sure that the AC power cord is not connected to an AC outlet and that the cable from the optional battery back-up assembly is not connected to the main cabinet power supply.
6. Locate the proper board slot. Remember, the CPU board plugs into a unique slot.
7. With your static discharge wrist strap properly grounded, remove the board and card assembly from the static protection bag. Orient it with the top and bottom guides in the main cabinet board cage, and press it in firmly until the board edge connector properly mates with the backplane connector.

CAUTION

When pressing the board and card assembly into place, press it only at the extractor lever locations. If you apply pressure at other locations, you may damage the board assembly.

8. Make a final inspection to ensure that the board and card assembly is in the correct slot, oriented correctly and mated properly; then install and tighten the supplied screws to secure it to the board cage.



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Installing The Assembled Software And CPU Board

3.3 Installing The Services Boards In The Equipment Cabinet

1. Be sure that the AC power cord is not connected to an AC outlet and that the cable from the optional battery back-up assembly is not connected to the main cabinet power supply.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

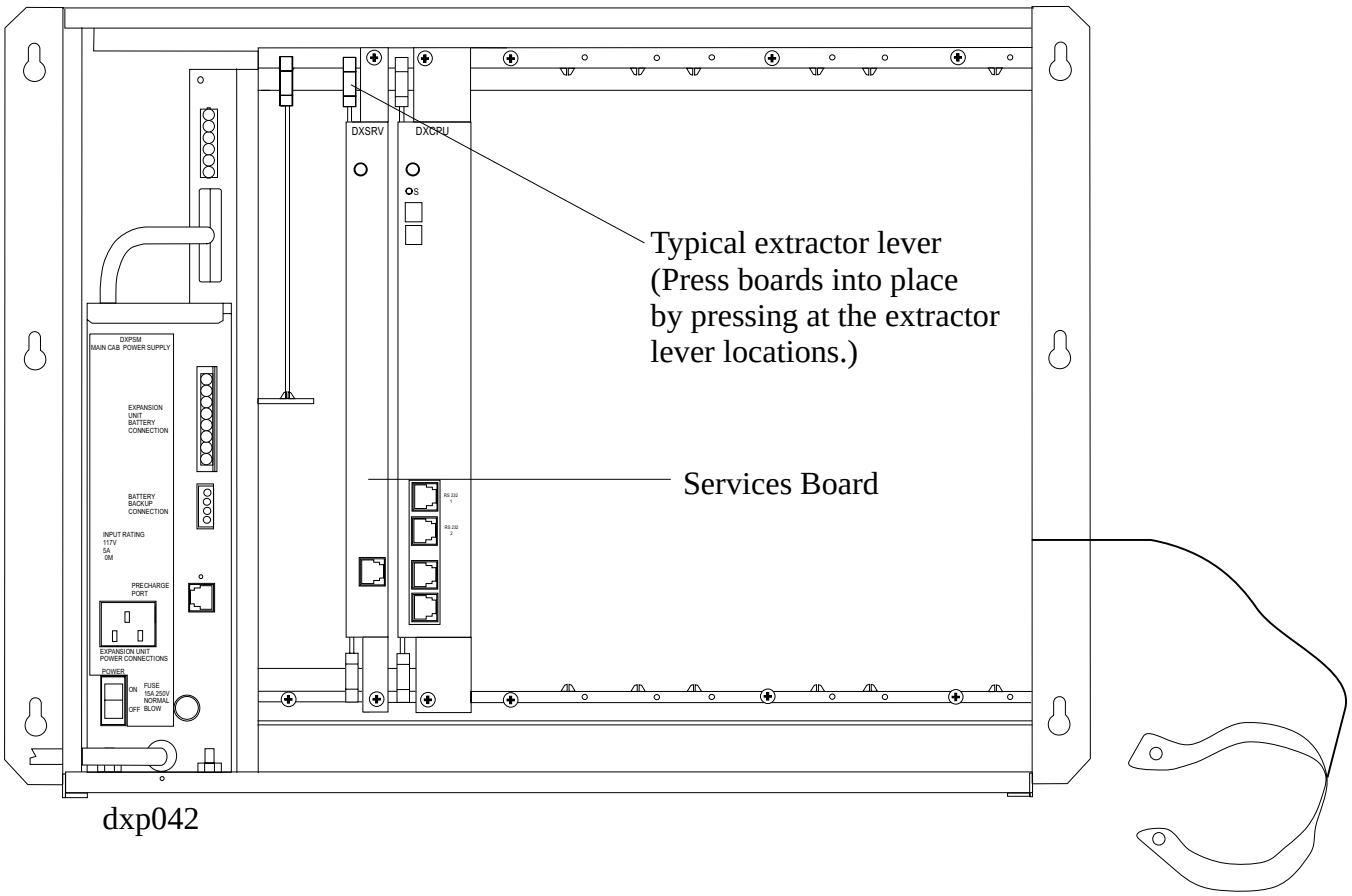
NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. When you are ready to install the circuit board, remove it from its static protection bag.
4. Locate the proper board slot. Remember, the service board plugs into into a unique slot.
5. Orient the circuit board with its top and bottom guides in main cabinet board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane.

CAUTION

When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

6. Repeat steps 3 and 4 until all circuit boards are installed.
7. Make a final inspection to ensure that all circuit boards are, oriented correctly and mated properly.
8. Install and tighten the supplied screws to secure the circuit boards to the board cage.



dxp042

Viewing The Services Board Installation

4.0 Connecting Data Devices

The system provides two serial data ports on the CPU board. The system designates these modular jacks as RS–232 1 and RS–232 2. Use either of these two serial data ports for connecting the video display terminal (VDT) that you will use to program the data base. Use either of these serial data ports for connecting the remote servicing and programming modem that you can use to remotely load the programmed data base and troubleshoot the system.

NOTE: If you connect a modem other than the DXMDM, you must interface that modem through a comunications card that you have installed on an auxiliary board.

Use the RS–232 2 port for connecting a serial data printer for SMDR, SMDA, and COS printouts or reprogram the system so that a serial data port on a comunications card that you have installed on an auxiliary board will accept the printer.

CAUTION

When you are not using a VDT for programming purposes, you should disconnect it from the serial data port. It is possible for the idle connected VDT to induce electrical interference that may affect system performance.

The distance between a data device and the common equipment can be up to 500 feet in a quiet electrical environment; however, you might find that you need to use shielded cable at some sites for long runs. For distances longer than 500 feet, use limited distance modems to relay the data communications between the common equipment and the data device.

When preparing a data cable for connection to a data device, refer to the manufacturer's manual for the equipment being interfaced, and make the following wiring connections:

- Wire the common equipment RD (data from device to common equipment) connection to the device TD (transmit data) connection.
- Wire the common equipment TD (data to device from common equipment) connection to the device RD (receive data) connection.
- Wire the common equipment SG (signal ground) connection to the device SG (signal ground) connection.
- If required for proper operation, wire the common equipment CTS (clear-to-send status from device to common equipment) connection to the device RTS (request-to-send) connection.

NOTE: The common equipment requires a positive voltage, with respect to signal ground, in order to send data.

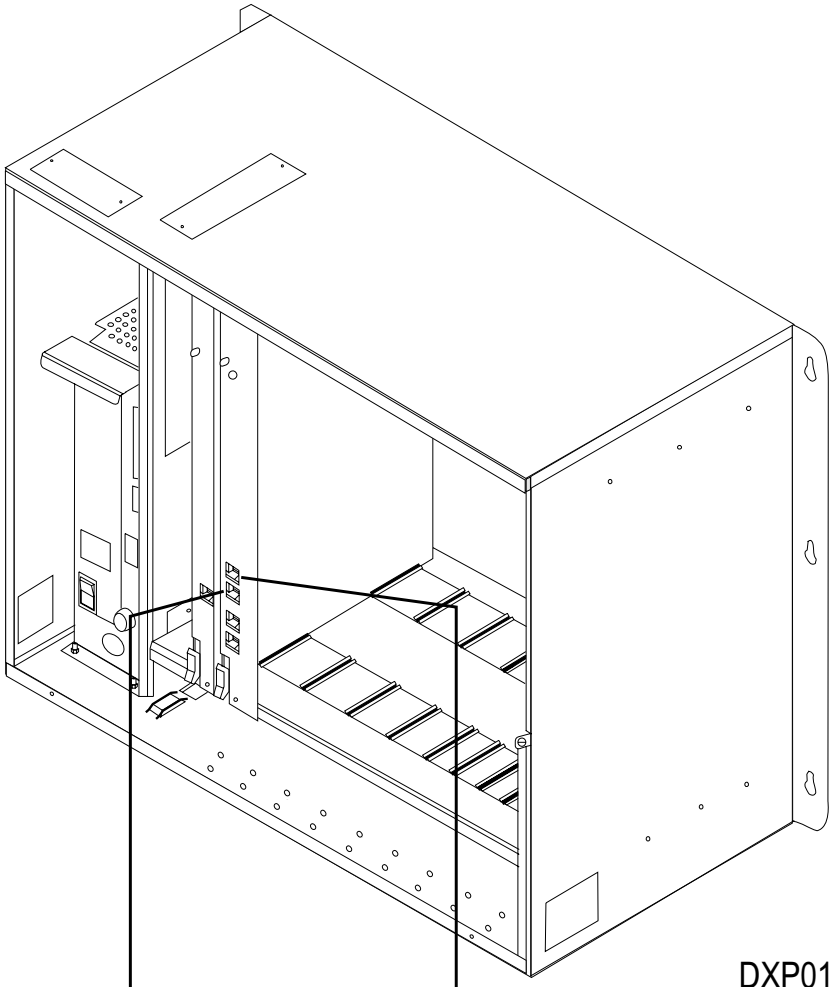
- If the cable has spare wires, be sure to ground them so that they will not act as antennas and induce interference into the system. Further, if there is a source of RF power nearby (such as a radio transmitter), use shielded cable and ground the shield at both ends.

The default data format is shown in the following chart. Configure the data device that you connect to the maintenance port to match the charted information.

Port Type	Baud Rate	Data Bit	Stop Bit	Parity Bit
RS–232 1	**9600**	**8**	**1**	**0**
RS–232 2	**300**	**7**	**2**	**0**

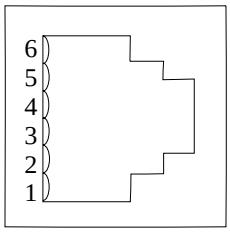
CAUTION

As an added precaution against induced interference, route the data cable as far away from any fluorescent lighting as you can reach, and make every effort to route the data cable perpendicular to other wiring.

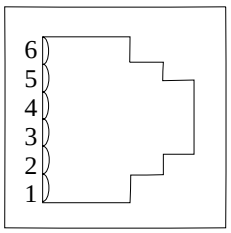


DXP017

RS-232 2



RS-232 1



(Front View of Jacks)

RS-232 Modular Jacks

Pin 1 = Request To Send
Pin 2 = Clear To Send
Pin 3 = Receive Data
Pin 4 = Transmit Data
Pin 5 = Signal Ground
Pin 6 = Frame Ground

NOTE 1: The maximum distance between the two serial data ports and the external data equipment is limited to 500 feet. Use shielded cable for long runs. For distances longer than 500 feet, use limited distance modems to relay the data communications between the common equipment and the data device.

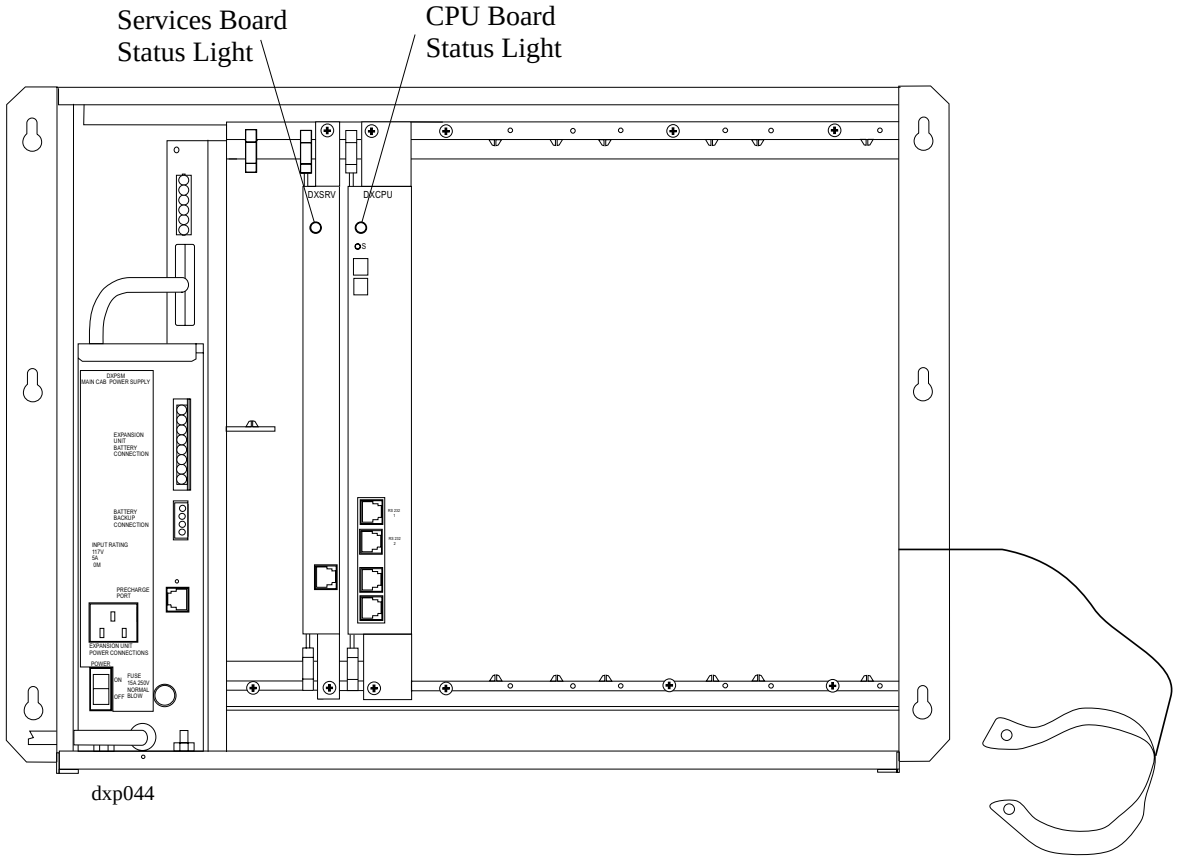
NOTE 2. Some data devices require a CTS signal for proper operation. Route this signal lead as needed.

Detailing Typical Data Device Connections

5.0 Viewing The Circuit Board Status Indicators

Once you have installed the CPU board and services board in the main cabinet, turn on the AC power and observe the board's status lights.

CPU Board	Steady On = Normal Operation
	Steady Off = System Malfunction
Services Board	Steady On = Normal Operation
	Steady Off = System Malfunction
	Flashing = Micoprocessor Malfunction



Locating The CPU And Services Board Status Lights

Installed Station and Line boards also provide status light indications:

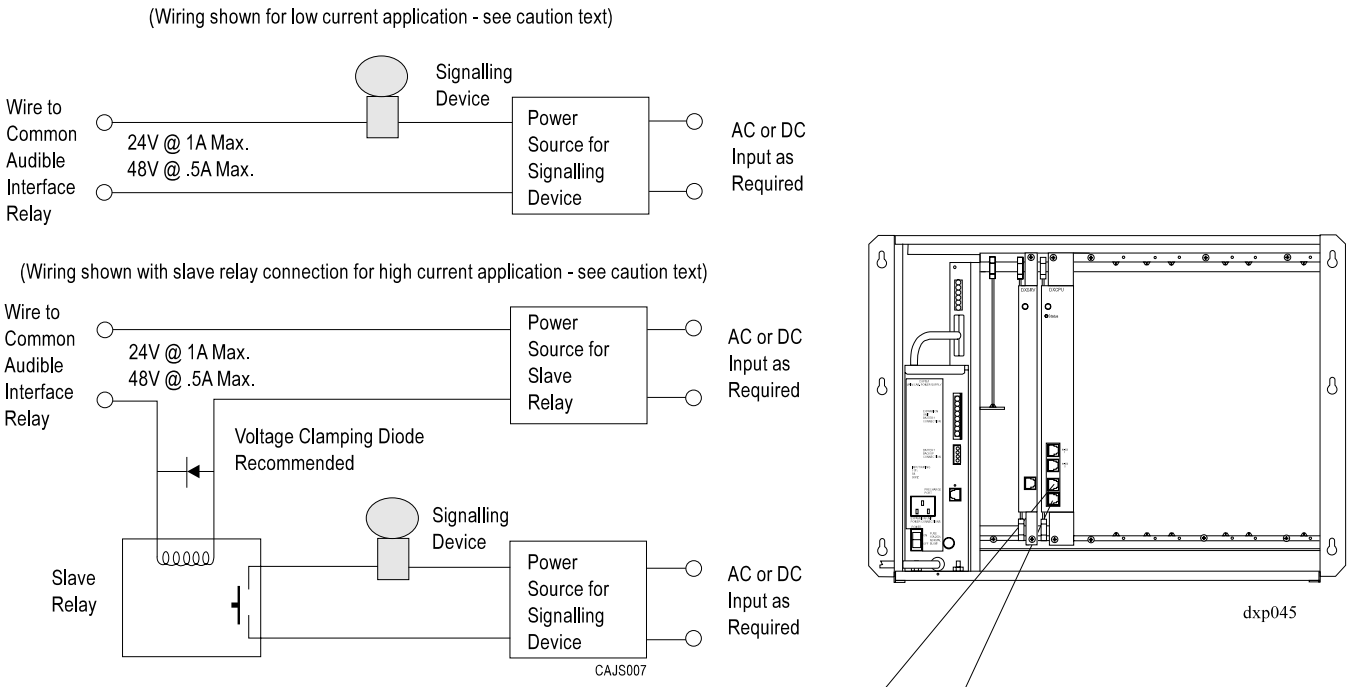
Station Boards	Rapid flash = malfunctioning micro-controller
	Off with repeated 5 second blink on = normal operation with all stations idle
	On with repeated 5 second blink off = normal operation with at least one station busy
	Steady on or steady off = board malfunction
Line Boards	Rapid flash = malfunctioning line board processor
	Off with repeated 5 second blink on = normal operation with all lines idle
	On with repeated 5 second blink off = normal operation with at least one line busy

6.0 Configuring The Common Audible Ringing Interface

The CPU board provides relay actuation dry-contact terminals that you can use for controlling external ringing equipment. These relays are under programming control. You can program them to provide dry-contact actuations that track the ringing pattern of any of the programmed flexible ringing assignment ringing patterns.

CAUTION

Do not exceed a 1 amp at 24 volts (0.5 amp at 48 volts) load on these control terminals. If the load requirements exceed this limit, connect the load through an external slave relay. DO NOT CONNECT THESE CONTROL TERMINALS DIRECTLY TO THE 120VAC LINE.


(Wiring shown for low current application - see caution text)
Wire to Common Audible Interface Relay
24V @ 1A Max.
48V @ .5A Max.
Signalling Device
Power Source for Signalling Device
AC or DC Input as Required
(Wiring shown with slave relay connection for high current application - see caution text)
Wire to Common Audible Interface Relay
24V @ 1A Max.
48V @ .5A Max.
Power Source for Slave Relay
AC or DC Input as Required
Voltage Clamping Diode Recommended
Signalling Device
Slave Relay
Power Source for Signalling Device
AC or DC Input as Required
CAJS007
dxp045
Front View Of Jacks
1 2 3 4 5 6
Relay 2
Relay 1
1 2 3 4 5 6
Relay 4
Relay 3

Common Audible Interface Relays

Relay Jack	Pin No.	Signal
J3	1	No Contact
	2	Relay 1
	3	Relay 2
	4	Relay 2
	5	Relay 1
	6	No Contact
J4	1	No Contact
	2	Relay 3
	3	Relay 4
	4	Relay 4
	5	Relay 3
	6	No Contact

Relay 1 = Normally Closed
Relay 2-4 = Normally Open

Detailing Typical Common Audible Interface Wiring

7.0 Configuring The External Paging Interface

A special transformer-isolated external paging port, located on the services board, provides system interface for an external paging amplifier. Connect a customer-supplied paging amplifier to the PAGE jack as shown in illustration.

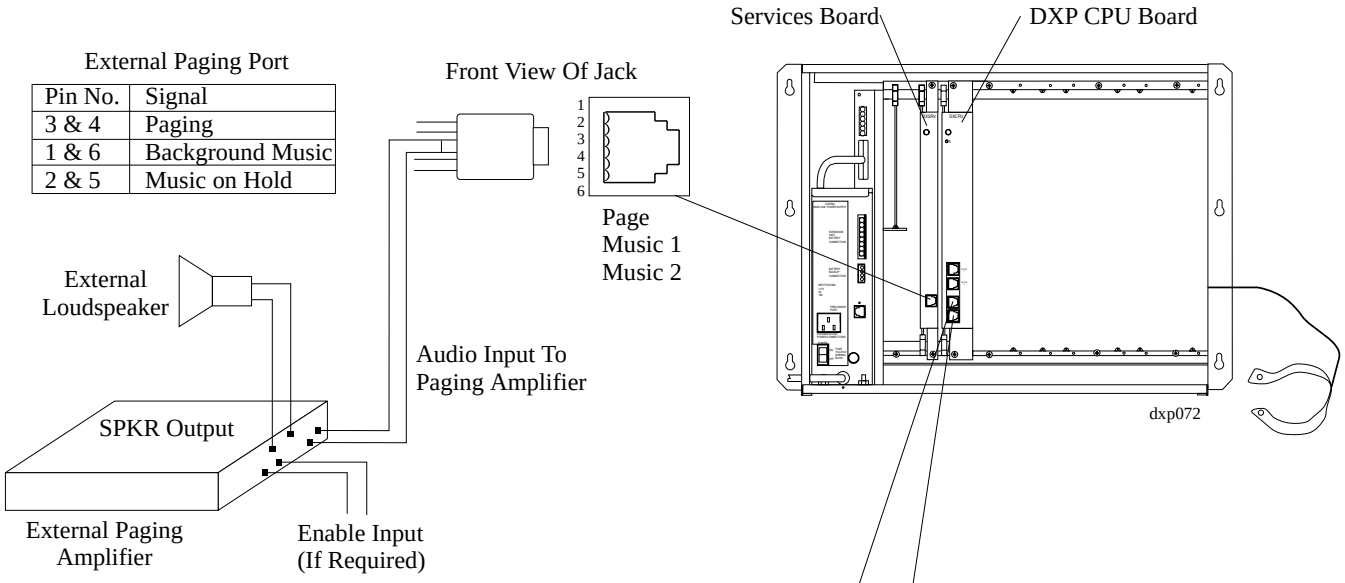
Remember, the CPU board provides relay actuation dry-contact terminals that you can use for controlling the external paging amplifier. Of course, you must make the necessary wiring arrangements to match the control that you want to occur.

Once you have made the necessary wiring connections, you may either:

- program any of the relays to provide dry-contact actuation that will turn on the paging amplifier for as long as the paging port is active,
- or program any of the relays to use their dry-contact actuations to track line ringing signals sent from the paging port. (This is useful for turning the amplifier on and off to sound these ringing signals.)

CAUTION

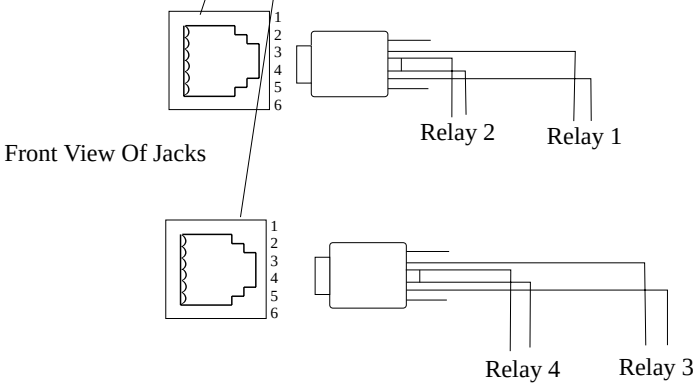
Do not exceed a 1 amp at 24 volts (0.5 amp at 48 volts) load on these control terminals. If the load requirements exceed this limit, connect the load through an external slave relay. DO NOT CONNECT THESE CONTROL TERMINALS DIRECTLY TO THE 120VAC LINE.



Pin No.	Signal
3 & 4	Paging
1 & 6	Background Music
2 & 5	Music on Hold

Common Audible Interface Relays

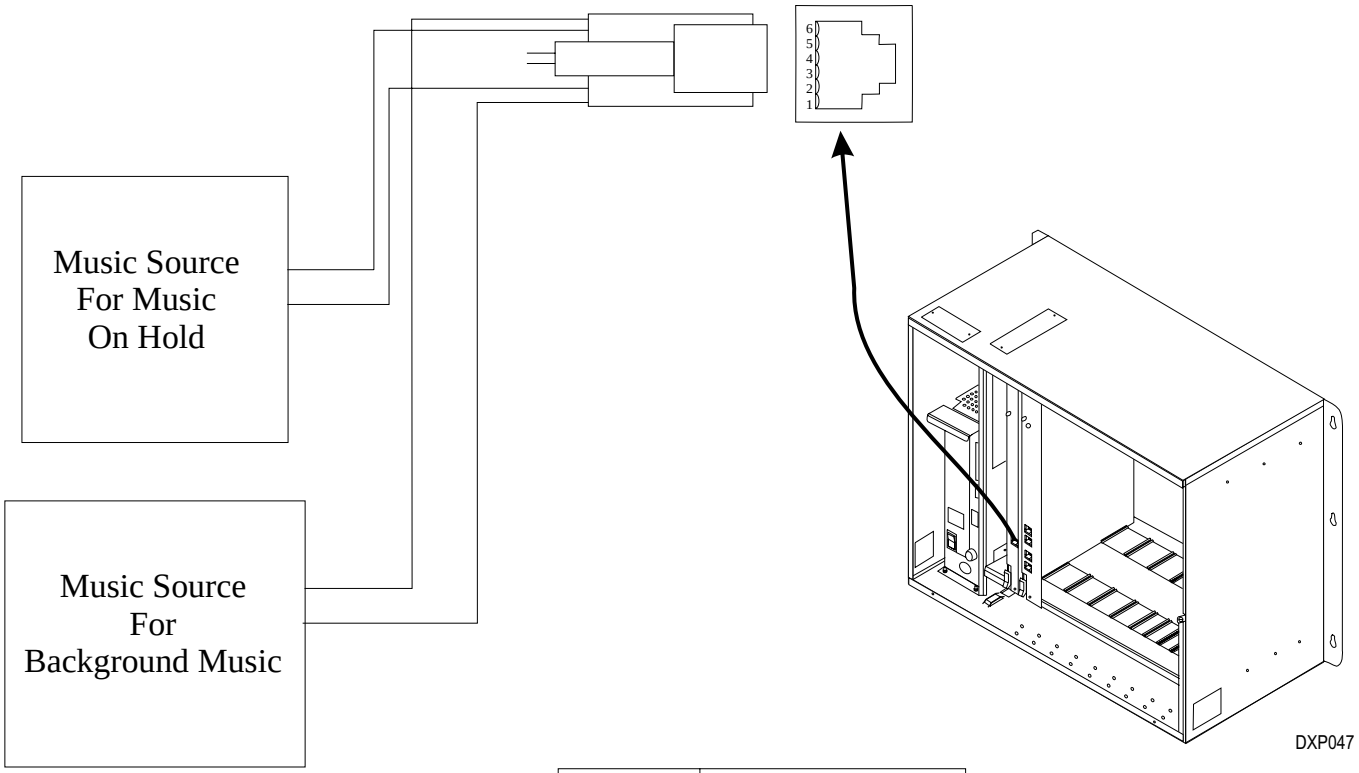
Relay Jack	Pin No.	Signal
J3	1	No Contact
	2	Relay 1
	3	Relay 2
	4	Relay 2
	5	Relay 1
	6	No Contact
J4	1	No Contact
	2	Relay 3
	3	Relay 4
	4	Relay 4
	5	Relay 3
	6	No Contact



Making A Typical External Paging Connection

8.0 Installing An External Audio Source

If music or other audio information is to be part of the system, connect a customer-provided audio source to the common equipment music interface jack provided on the services board. These jacks are labeled MOH and BGM. You can provide different audio sources, one for outside parties while on hold and another for internal background music, if desired. The input impedance of the music interface is approximately 500 ohms. Use the volume control on the audio source(s) to adjust the audio level of the music source(s) as required.



PIN No.	Signal Input
1 & 6	Background Music
2 & 5	Music on Hold

NOTE: Use One Source For Both Inputs If That Is Acceptable To Users.

Installing An External Audio Source

9.0 Understanding FCC Rules And Regulations

This DXP digital communications system complies with Federal Communications Commission (FCC) Rules, Part 68. The FCC registration label on the equipment cabinet contains the FCC registration number, the ringer equivalence number, the model number, and the serial number or production date of the system.

Notification To Telephone Company

Unless a telephone operating company provides and installs the system, the telephone operating company which provides the lines must be notified before a connection is made to them. Provide the telephone company with the lines (telephone numbers) involved, the FCC registration number, the ringer equivalence number, the Facilities Interface Code (FIC), the Universal Service Ordering Code (USOC), and the USOC jack required. The FCC registration number and the ringer equivalence number is provided on the label attached to the common equipment. The FIC and USOC information is provided in the equipment's general specifications found in equipment system manual. The user/installer is required to notify the telephone company when final disconnection of this equipment from the telephone company line occurs.

Compatibility With Telephone Network

When necessary, the telephone operating company provides information on the maximum number of telephones or ringers that can be connected to one line, as well as any other applicable technical information. The telephone operating company can temporarily discontinue service and make changes which could affect the operation of this equipment. They must, however, provide adequate notice, in writing, of any future equipment changes that would make the system incompatible.

Installation Requirements

Connection of the DXP system to the telephone lines must be through a universal service order code (USOC) outlet jack supplied by the telephone operating company. If the installation site does not have the proper outlet, ask the telephone company business office to install one. The correct outlet jack for this system is either a type RJ21X or type RJ14C.

Party Lines And Coin Lines

Local telephone company regulations may not permit connections to party lines and coin lines by anyone except the telephone operating company.

Troubleshooting

If a service problem occurs, first try to determine if the trouble is in the on-site system or in the telephone company equipment. Disconnect all equipment not owned by the telephone company. If this corrects the problem, the faulty equipment must not be reconnected to the telephone line until the problem has been corrected. Any trouble that causes improper operation of the telephone network may require the telephone company to discontinue service to the trouble site after they notify the user of the reason.

Repair Authorization

FCC regulations do not permit repair of customer owned equipment by anyone except the manufacturer, their authorized agent, or others who might be authorized by the FCC. However, routine repairs can be made according to the maintenance instructions in this publication, provided that all FCC restrictions are obeyed.

Installing The DXP
Expansion Common Equipment Cabinet

1.0 Installing The Expansion Common Equipment Cabinet

1.1 Considering The Mounting Parameters

Locate the expansion cabinet directly above the main cabinet assembly. Allow approximately one inch or less of clearance between the cabinets.

1.2 Inventorying The Tools And Hardware

- Round head wood screws (typically $^{1}/_{4}$ x 1–inch)—for mounting expansion equipment cabinet to backboard)
- Cross recessed screwdriver (phillips-head type)—to match front panel shipping screws
- Flat blade screwdriver—to match front panel retaining screws
- Electric drill—if prepared holes are required
- Connecting tool—for fastening wires to a type-66 connector block.
- Crimping tool—for 623-type modular plugs
- Static discharge wrist strap and conductive floor mat

1.3 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

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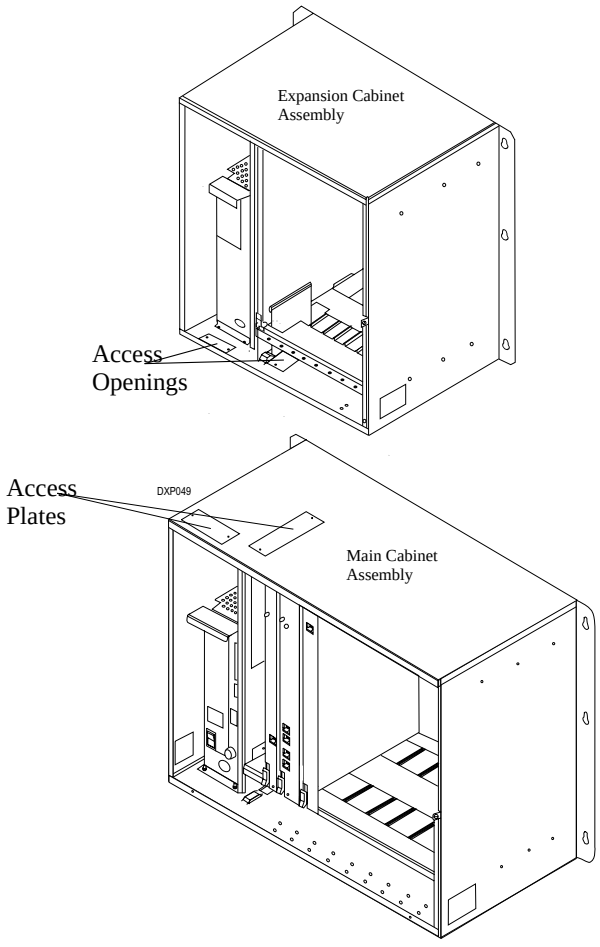
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The information contained herein does not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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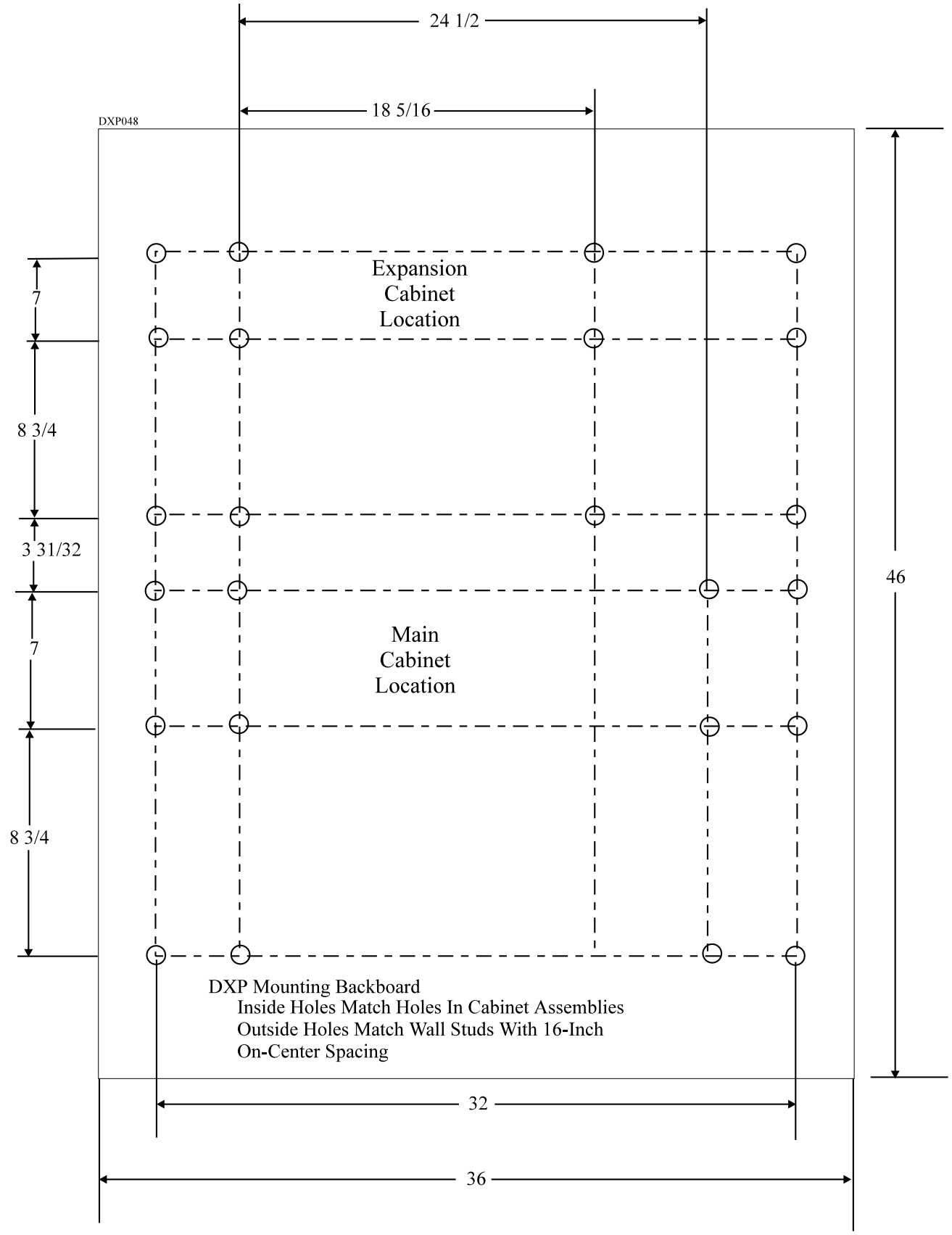
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1.4 Mounting The Expansion Common Equipment Cabinet

1. Unpack and carefully inspect all equipment for shipping damage. Notify the shipper immediately of any damages found. Verify that the packages contain all parts and accessories needed for proper installation and operation.
2. Th expansion cabinet mounts above the main cabinet. After you determine where you will mount the expansion cabinet, remove the plates covering the appropriate interface cable access holes on the main and expansion cabinets. As you face the front of the cabinets, these plates are located near the left front of the cabinet's top and bottom.
3. The illustration shows the locating dimensions required for the expansion cabinet's mounting screws. Mark the hardware locations on the backboard above the main common equipment cabinet. (You must mount the cabinet vertically on the backboard.)
4. Drill holes in the backboard of a proper size to accommodate the hardware being used.
5. Insert the two top screws into the backboard and tighten them to within approximately 1/8-inch of the surface.
6. Hang the cabinet on the top screws using the top mounting holes in the rear mounting flange of the cabinet. Note that these holes are elongated with an enlargement at one end. This feature allows the cabinet to slide down on the screws to secure the mounting when the cabinet is hung on them.
7. Use the openings for the middle and lower set of mounting screws as a guide, and mark the location for the remaining screws.
8. Lift the cabinet from the top screws and set it aside while preparing the holes for the remaining screws.
9. Rehang the cabinet as discussed in step 6.
10. Insert the middle and lower screws into the backboard and tighten them to within approximately 1/8-inch of the surface.
11. Shipping screws attach the front panel to the main cabinet. These screws are in addition to the two retaining screws located at the lower corners of the panel. Remove and store the shipping screws. You will not need them to re-attach the panel to the cabinet after you have installed the power supply assembly, circuit boards, and wiring; however, you will need them to secure the panel in place if you should later transport the cabinet to a new location.
12. After you remove the shipping and retaining screws, pivot the front panel upward until you can unhook the panel hangers from the slots in the cabinet top. To re-attach the front panel, pivot it upward so that you can hook the panel hangers into the slots at the top of the cabinet, and then pivot the panel down in place. Install the two retaining screws at the bottom right-hand and left-hand corners of the panel to secure it to the cabinet.



Locating The Access Plates



Mounting The Cabinets

1.5 Understanding System Grounding Requirements

Transient voltage spikes, if induced onto CO or CENTREX lines, can travel through the cable and into the common equipment. The telephone company offers basic protection against this condition but it is usually designed to protect the central office circuits. While it will also provide some protection to the common equipment, you should not rely upon it for total protection. To help ensure that external over-voltage surges do not damage the system, you should install and properly ground primary protection devices, such as gas discharge tubes or similar devices, on all lines. While the line boards have internal secondary surge protection on all line ports, in order for this protection to be effective, you **MUST** connect the common equipment cabinet to a reliable, effective earth ground.

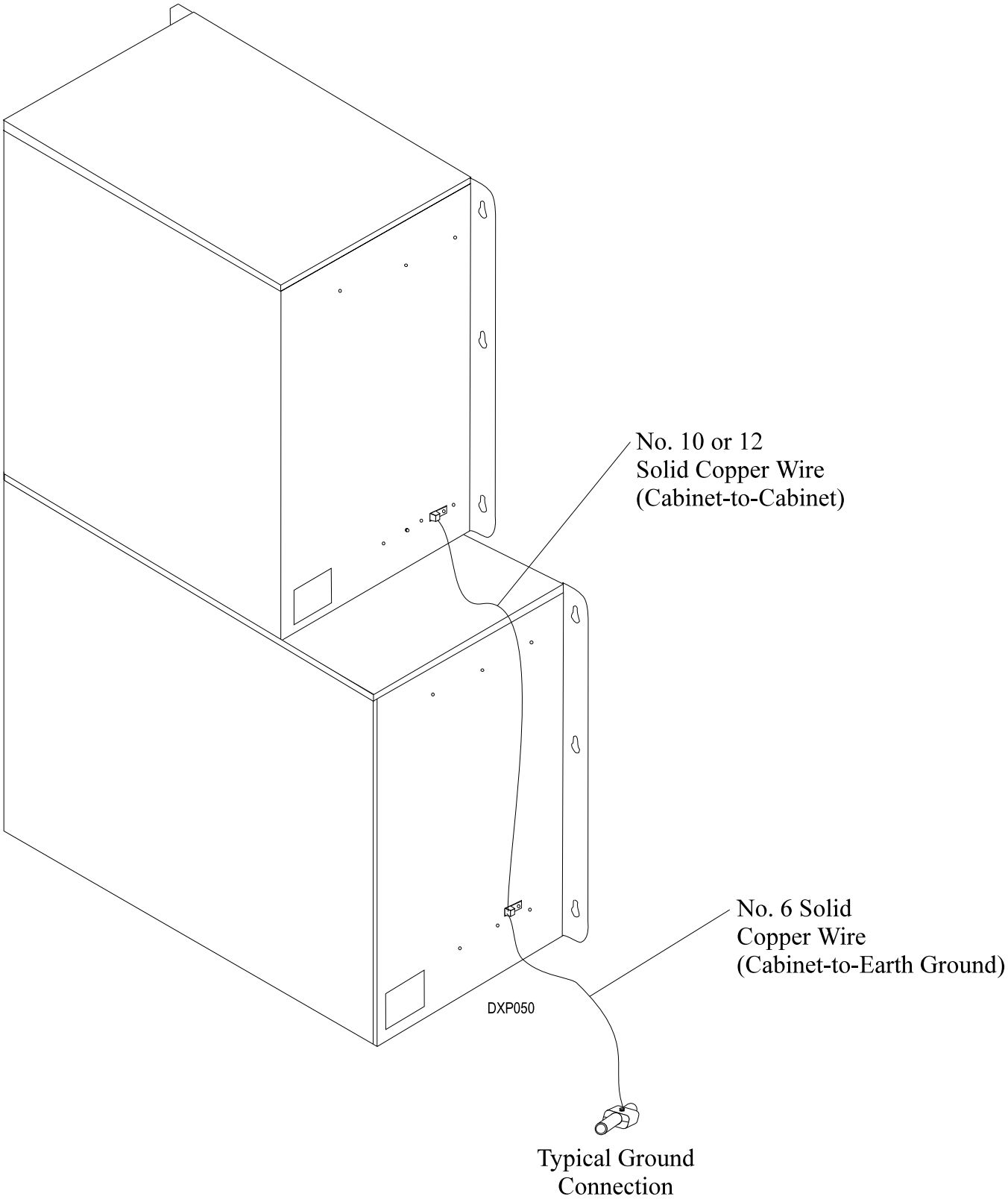
Proper DXP grounding is necessary for trouble-free operation and personnel safety. The DXP has the following three types of grounds:

- Service Ground—a neutral power line wire that is connected to the ground bus in the premises' AC power panel,
- System Ground—a non-current carrying power line wire that is connected to the ground bus in the premises' AC power panel,
- Frame Ground—a low impedance conductor that places the common equipment cabinet at reference ground potential. The frame ground provides the greatest safety by limiting electrical potential between non-current carrying parts of the system. The common equipment cabinet provides a ground stud on its cabinet for access to its frame ground.

Effective grounding requires that you connect the frame ground to a good earth ground. A good earth ground is one such as the ground bus in the premises' AC power panel or a public metallic cold water pipe at a point immediately at its entrance to the premises and ahead of any meters, pumps, or insulating sections that have been added for vibration reduction. Avoid using the premises' structural steel frame as it may not be at earth ground potential. Use #10–12 or larger insulated solid copper grounding wire to connect the frame ground of the expansion cabinet (available through the ground stud on the expansion cabinet's side) to the frame ground of the main common equipment cabinet. Use #6 or larger insulated solid copper grounding wire to make the ground connection from the main cabinet's frame ground to earth ground. **Keep this ground wire separate from the three-wire AC line cord, do not splice it, and keep it as short as possible.**

The impedance of the wiring between the DXP and the earth ground must not exceed 0.25 ohms and the impedance between the earth ground and the power company's reference standard ground must not exceed 5 ohms. Use an acceptable low impedance measuring device to measure the impedance of these paths. The #6 or larger wire size will minimize the wiring impedance; however, if the impedance between earth ground and the power company's standard reference ground exceeds 5 ohms, contact the local power company. The ground path must always be of sufficient current-carrying capacity to prevent a build up of voltages that may result in circuit noise, hazard to personnel, or equipment damage.

Be sure that all of the ground connections are visible for inspection and maintenance. Tag all of the ground connections with a sign that reads: *Do Not Remove Or Disconnect*.



Grounding The Expansion Cabinet

2.0 Installing The Power Supply

NOTE: The common equipment cabinet employs an electronic switching power supply. During operation, power supplies of this type generate an audible sound from their switching regulators. This sound is normal and is not an indication that the power supply is operating improperly.

Install the power supply assembly in the expansion cabinet per the following discussion and illustration.

1. Be sure to ground the common equipment cabinet per the instructions in the previous paragraph before installing the power supply assembly.
2. Remove the power supply assembly from the carton. Be sure to save the small bag containing the mounting hardware.
3. Slide the power supply into the opening at the left side of the expansion cabinet and lower the front mounting holes over the threaded studs protruding up from the cabinet frame.
4. Remove the two #8-32 hex nuts and #8 lockwashers from the bag and install them on the threaded studs to secure the power supply in place. Be sure to tighten them securely.
5. Remove the #6-32 hex nuts and #6 lockwasher from the bag and install it through a tab on the rear of the power supply chassis into the back of the cabinet
6. Route the power cable from the power supply, to the right edge and below the ring generator mounting rails, up to the connector on the backplane and connect it there.
7. Route the supplied power interface cable between the expansion cabinet power supply and the main cabinet power supply assembly and connect it to both.
8. Obtain the ferrite collar that is included with the power supply assembly, and snap it on the power interface cable.
9. Route the AC line cord from the power supply through the front square openings in the bottom of the expansion cabinet and the top of the main cabinet (exposed by removing the access plates during cabinet installation) to the front of the main cabinet power supply, and connect it.
10. If battery back-up is part of the installation, route the DC cable from the main cabinet to the expansion cabinet and connect it to the battery back-up connector on the expansion power supply.

CAUTION

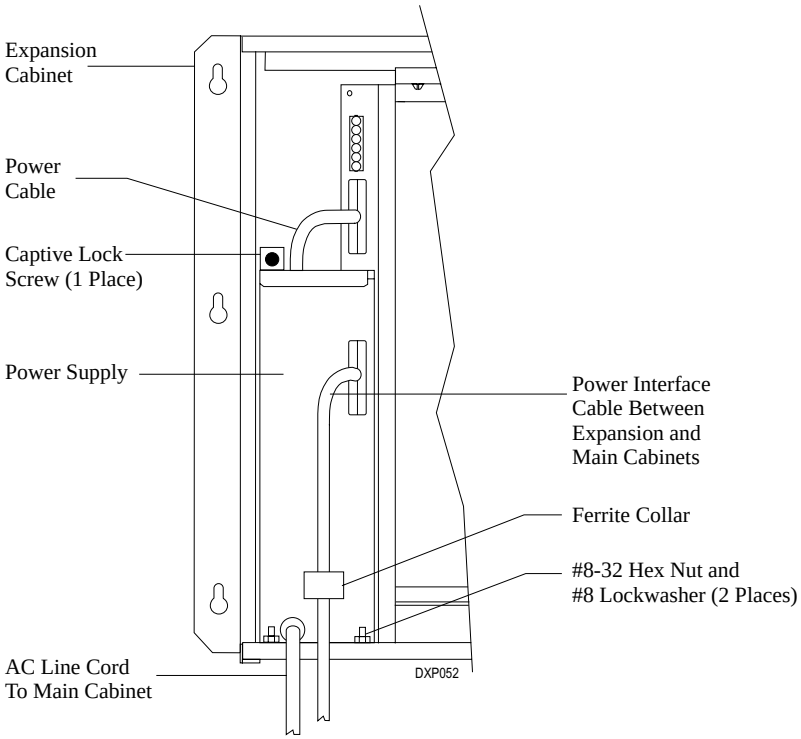
Do not connect the AC power cord until the circuit boards have been installed and the installation has been checked.

2.1 Making The AC Power Connection

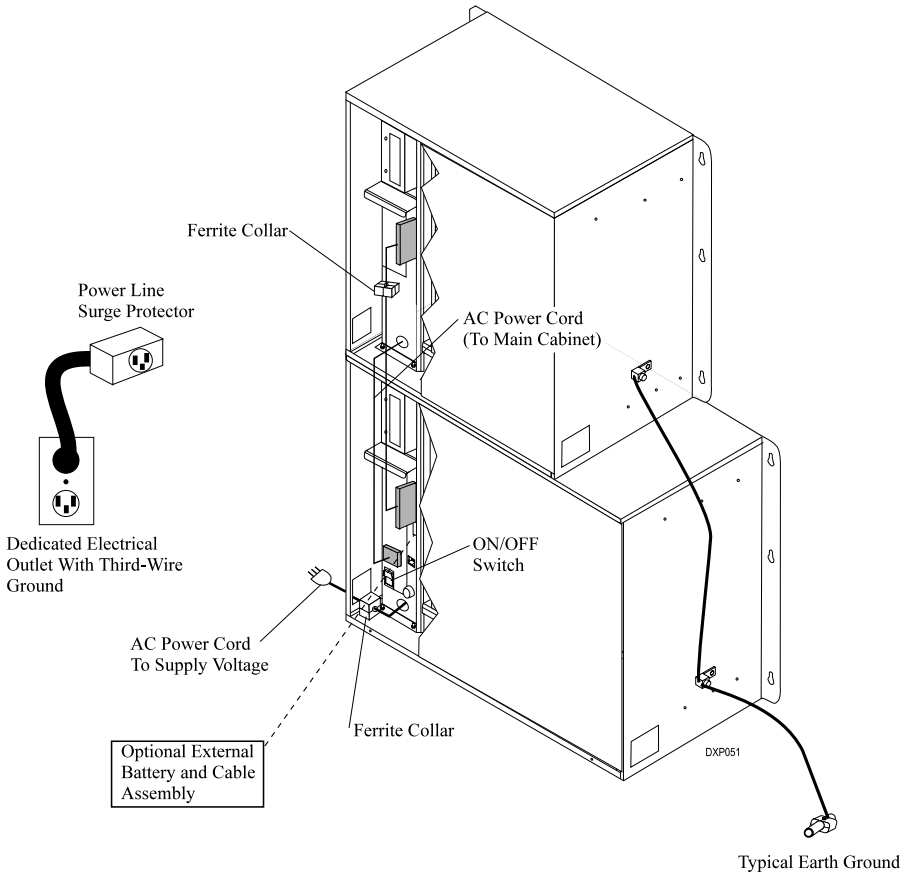
- For the main cabinet's AC power connection, employ a dedicated 117 VAC 15 AMP circuit, with a third-wire ground, supplied to a standard electrical outlet (NEMA 5-15R). Remember, this electrical outlet must be located within four feet of the common equipment cabinet.
- To provide protection against surges and spikes that may appear on the AC line, install a plug-in power line surge protector between the AC power cord of the installed equipment and the AC outlet..

CAUTION

DO NOT attach or secure the line cord to the surface of the mounting location in any manner.


Expansion Cabinet
Power Cable
Captive Lock Screw (1 Place)
Power Supply
Power Interface Cable Between Expansion and Main Cabinets
Ferrite Collar
#8-32 Hex Nut and #8 Lockwasher (2 Places)
AC Line Cord To Main Cabinet
DXP052

Installing The Power Supply Assembly



Making The AC Power Connections

2.2 Measuring The Power Supply Voltages

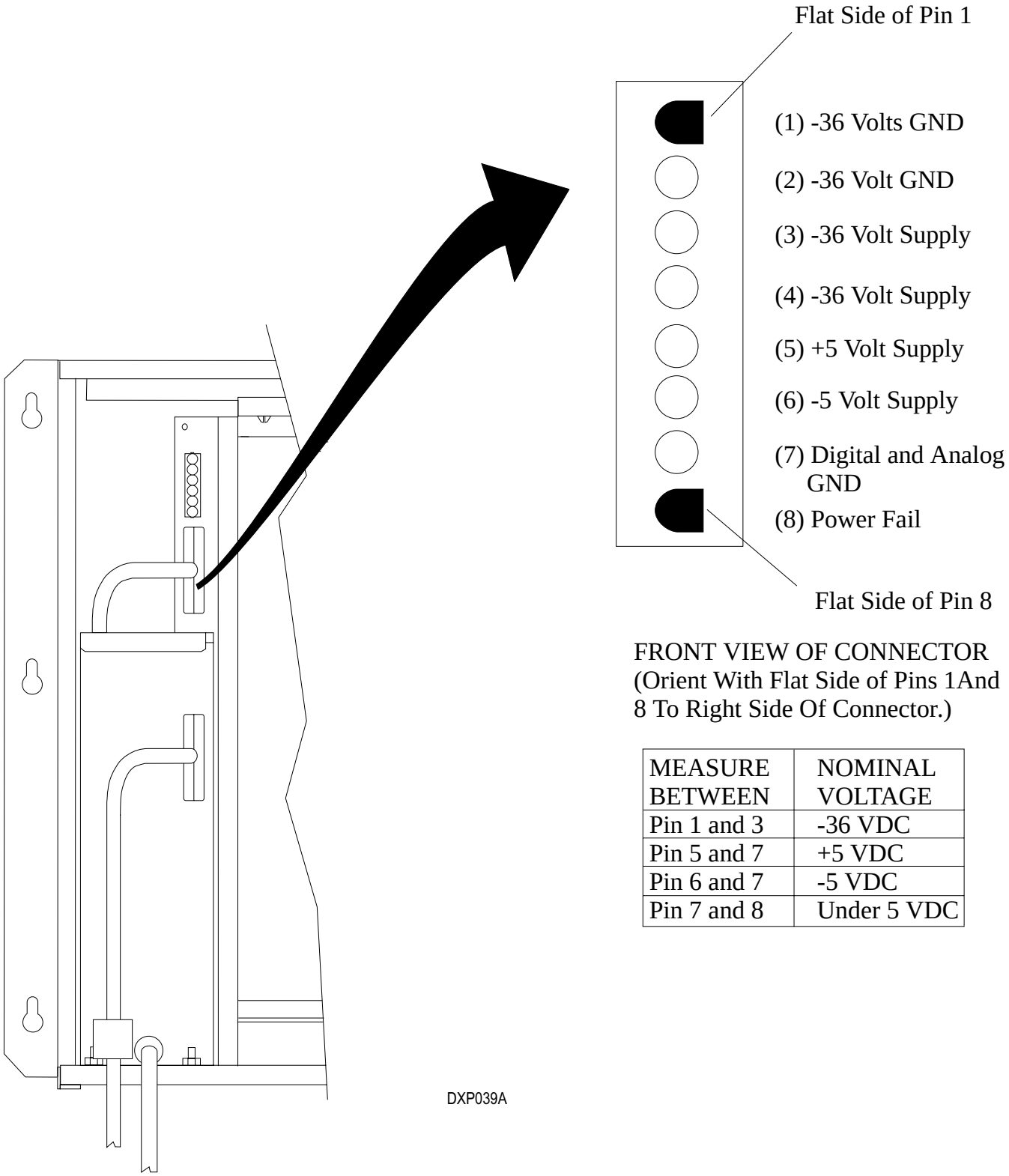
If you need to measure power supply voltages, you can do so at the voltage connector. Measure the power under the following conditions:

- AC line cord connected to the AC outlet,
- DC power cable disconnected from power supply's DC voltage connector,
- AC power switch turned on.

Measurement details are shown in the illustration.

CAUTION

Once you have measured the power supply voltages, turn off the AC power switch and disconnect the AC line cord from the AC outlet. Leave the AC power disconnected until you have installed the circuit boards in the main cabinet.



FRONT VIEW OF CONNECTOR
(Orient With Flat Side of Pins 1And 8 To Right Side Of Connector.)

MEASURE BETWEEN	NOMINAL VOLTAGE
Pin 1 and 3	-36 VDC
Pin 5 and 7	+5 VDC
Pin 6 and 7	-5 VDC
Pin 7 and 8	Under 5 VDC

Measuring The Power Supply Voltages

3.0 Installing Circuit Boards In The Expansion Cabinet

CAUTION

Circuit boards for the DXP system are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, for general information. Specific handling precautions are also included in this installation instruction.

Each circuit board is supplied in a static protection bag. Do not open a static protection bag prior to board installation time.

The board slots are keyed so that only those boards that will operate from a particular slot will plug into that slot.

The expansion cabinet provides a unique slot for the interface board and universal slots for line boards, or station boards.

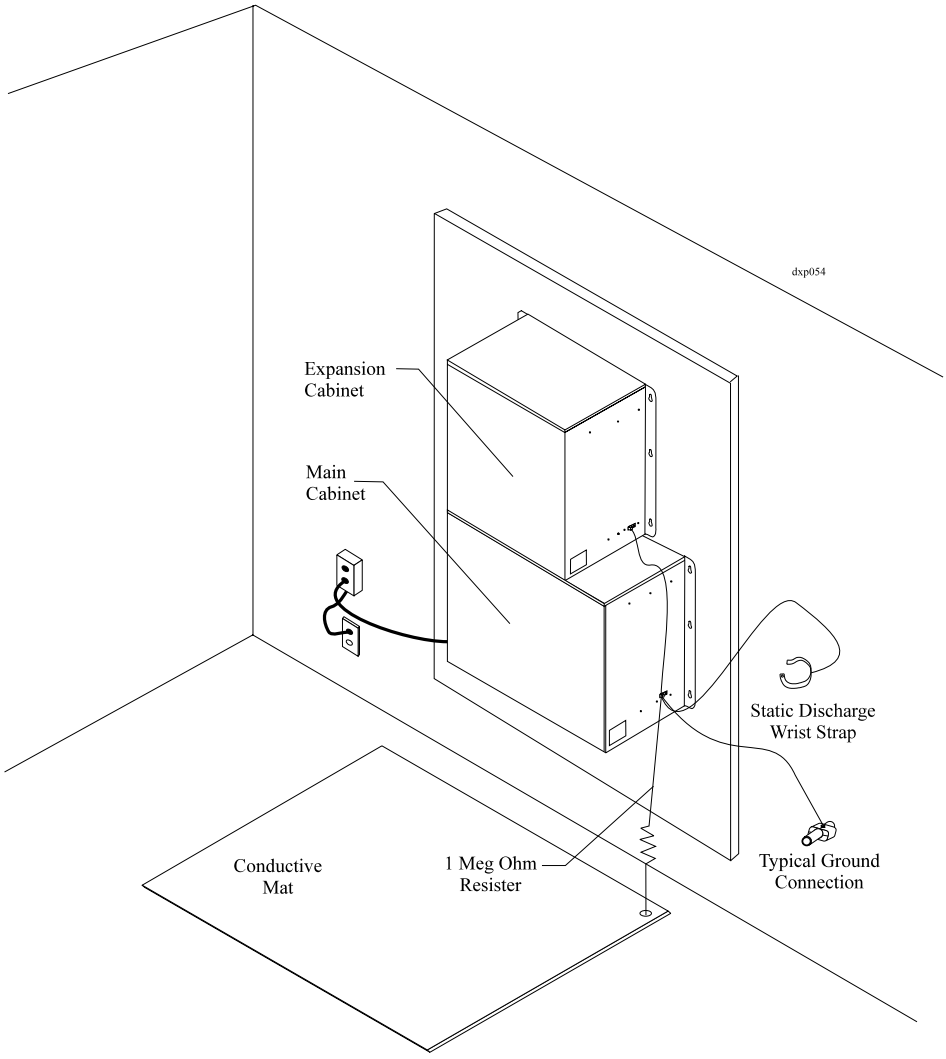
This publication provides installation instructions for the interface board. Since you will install line and station boards on an as needed basis, each of these boards include its own installation instruction for your reference.

3.1 Creating A Static Safe Work Area

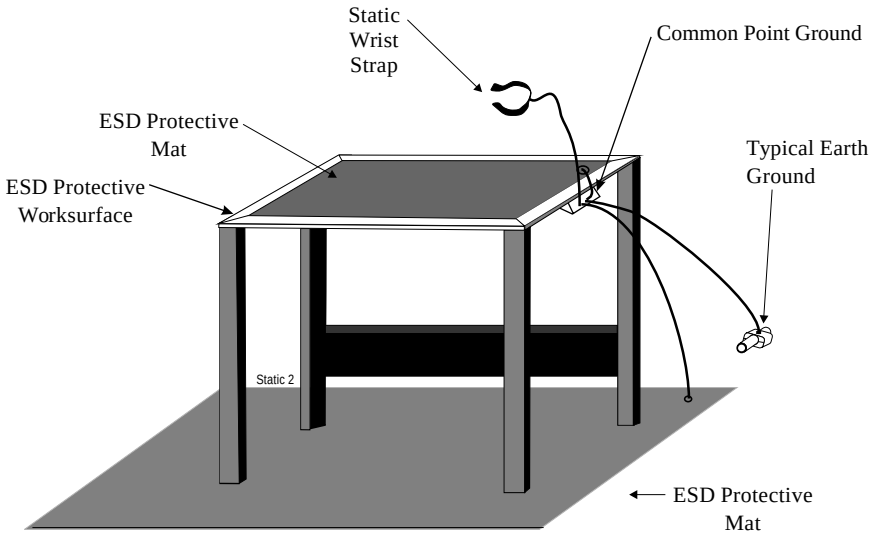
When servicing the main or expansion common equipment cabinets at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing a common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

3.2 Installing The Interface Boards

When you add an expansion cabinet to the main common equipment cabinet, you must install interface boards in both cabinets and route the accompanying cables through the cable access holes in the cabinets. You must install the main interface board in the main cabinet, the expansion interface board in the expansion cabinet.

1. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

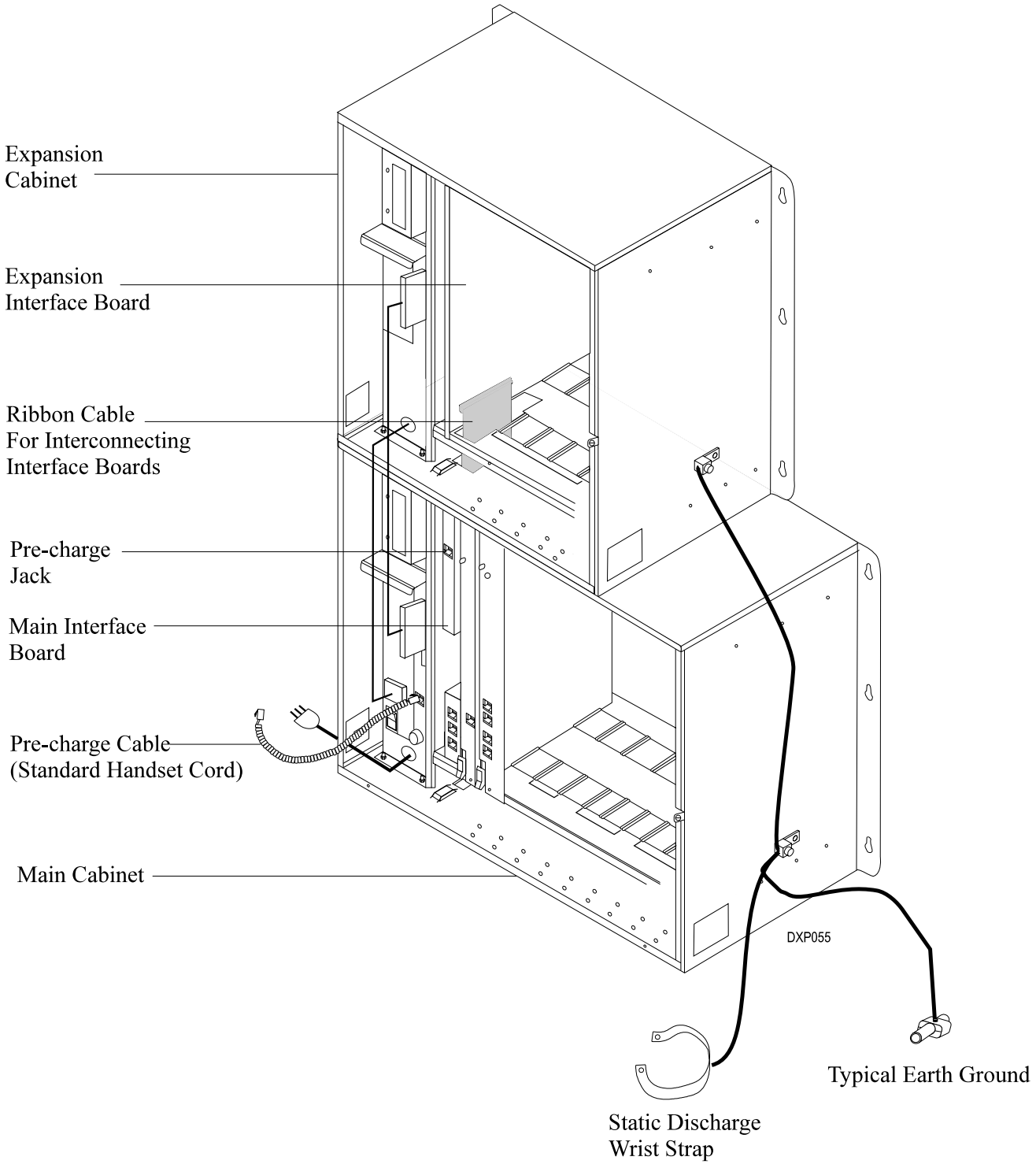
NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

2. When you are ready to install the circuit board, remove it from its static protection bag.
3. You can install the interface board in the main cabinet while the system is operational if you wish. To do so, connect a standard telephone handset cord between the precharge port on the main cabinet power supply and the precharge jack on the main interface board. Make this connection before you install the baord.
4. Locate the proper board slot. Remember, the interface boards all plug into unique slots in their respective cabinets.
5. Orient the circuit board with its top and bottom guides in main cabinet board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane.

CAUTION

When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

6. Remove the expansion interface board from its static protection bag, ard repeat steps 4 and 5.
7. Route the interface cables between the main and expansion cabinets. Be sure to thread the cables through the access holes in the cabinets.
8. Make a final inspection to ensure that all circuit boards are, oriented correctly and mated properly.
9. Install and tighten the supplied screws to secure the circuit boards to the board cage.



Viewing The Interface Board Installation

COMDIAL®

Installing The Analog Station Board In The DXP Digital Communications System

1.0 Introducing The Analog Station Boards

The analog station board supports the operation of the ExecuTech model 66nnn and 67nnn analog multiline telephones.

1.1 Inventorying The Analog Station Boards

There are two models of station boards available for use.

- Eight-station model supports eight ExecuTech multiline and single line proprietary analog telephones
- 16-station model supports 16 ExecuTech multiline and single line proprietary analog telephones

1.2 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

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The information contained herein does not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.
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2.0 Installing Circuit Boards

CAUTION

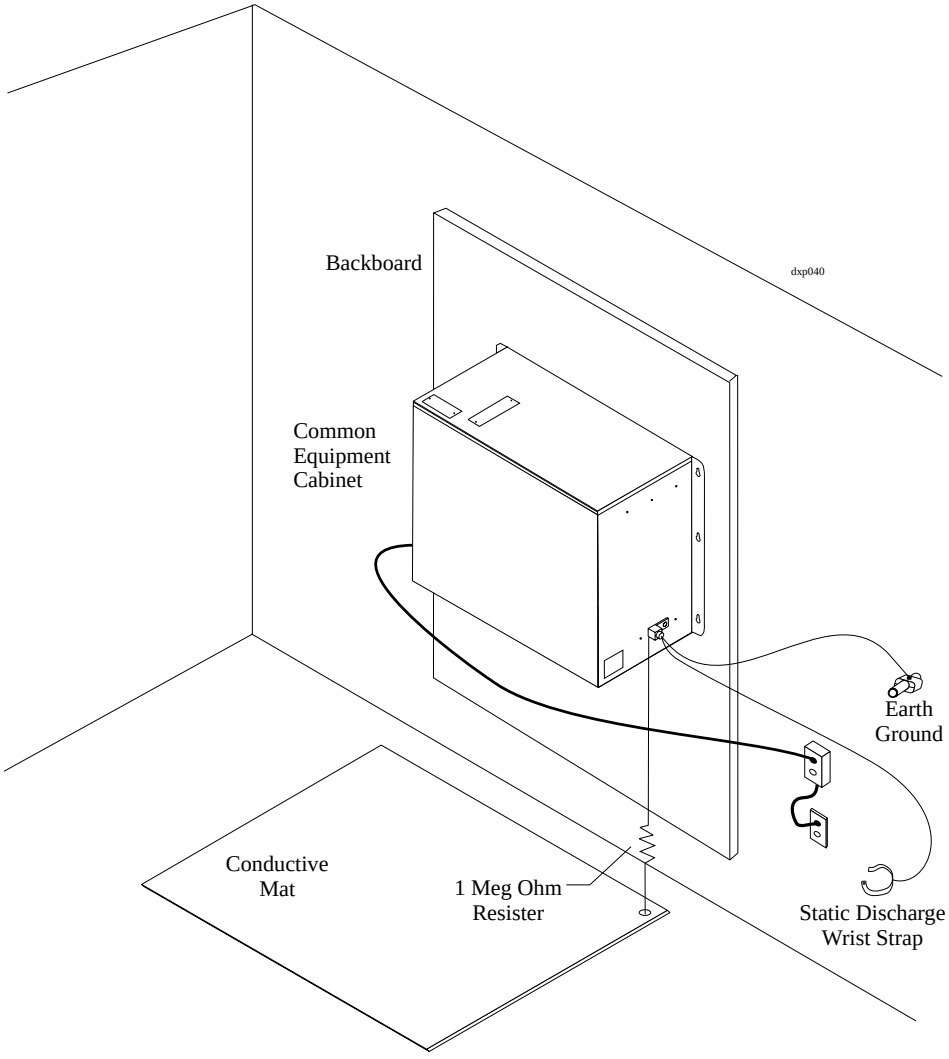
Circuit boards are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, for general information. Specific handling precautions are also included in this installation instruction.

2.1 Creating A Static Safe Work Area

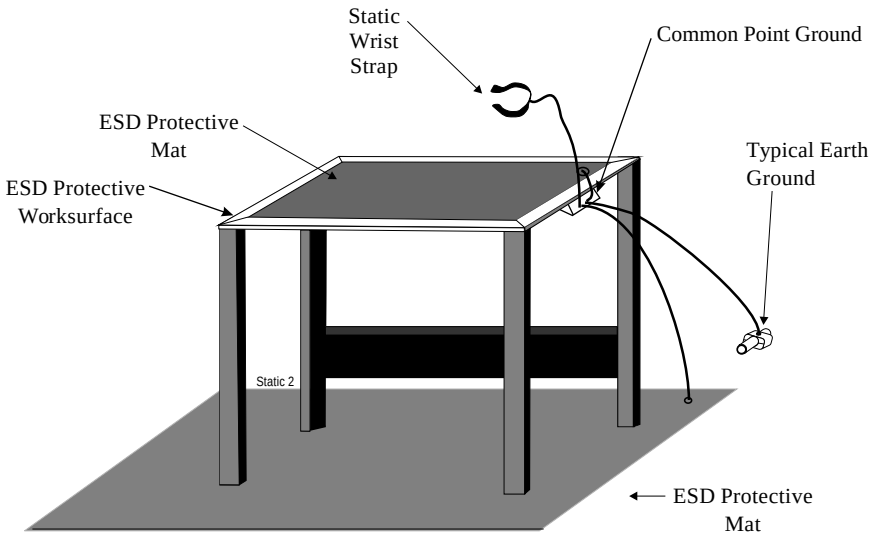
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

2.2 Installing Station Boards In The Equipment Cabinet

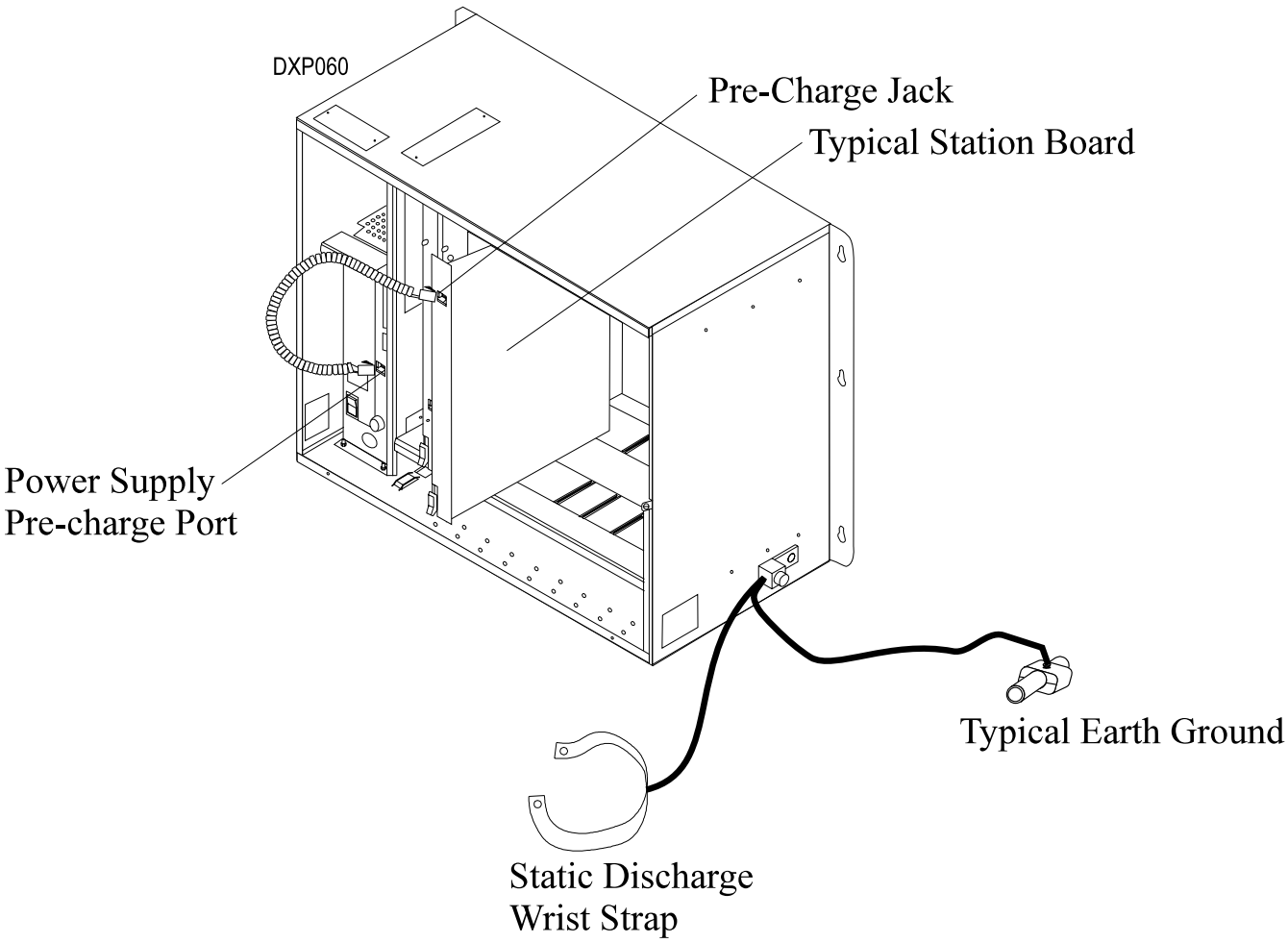
1. Normally you should first disconnect the optional battery back-up assembly from the main cabinet power supply and then disconnect the AC power cord from the AC outlet; however, when necessary, you can install a station board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the precharge port on the power supply. During step 5, you will connect the other end of this coil cord to the precharge jack on the station board.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. Each station board is supplied in a static protection bag for safe keeping. When you are ready to install the circuit board, remove it from its static protection bag.
4. Locate the proper board slot.
   - In DXP main cabinets, the station boards connect to universal slots 3 through 5. You can connect station boards in universal slots 1 and 2; however, if you do this, you will occupy the only slots that are available for auxiliary boards.
   - In DXP expansion cabinets, the station boards connect to any universal board slot.
5. If you are installing the station board in an operating system, connect the free end of the precharge cord that you installed in step 1 to the precharge jack on the station board.
6. Orient the station board with its top and bottom guides in main cabinet board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane. If you connected a handset cord between the pre-charge port on the power supply and the jack on the circuit board, disconnect the cord after installing the board.

   CAUTION

   When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.
7. Repeat steps 3 and 4 until all circuit boards are installed.
8. Make a final inspection to ensure that all circuit boards are, oriented correctly and mated properly.
9. Install and tighten the supplied screws to secure the circuit boards to the board cage.
10. Each station board includes a ferrite collar. Snap the ferrite collar around the cable station to provide protection against radio frequency interference.



Viewing A Typical Station Board Installation

3.0 Connecting The Stations

Connections between the telephone stations and the common equipment station boards are typically via type 66M-xx connector blocks that are cable connected to 50-pin male connectors on the station boards.

The American Wire Gauge (AWG) size of the station wiring determines the maximum distance allowed from the common equipment to the stations. The following chart details this relationship.

Station Types	Wire Gauge		
	20 AWG	22 AWG	24 AWG
Analog Multiline Telephone	**2500 Feet**	**2000 Feet**	**1500 Feet**
Analog Single-Line Proprietary Telephone	**4000 Feet**	**3500 Feet**	**3000 Feet**

If spare conductors exist in the cables that you run between the station boards and the 66M-xx connector blocks, it is a good practice to connect the spare conductors to earth ground. Doing this may help prevent the spare connectors from inducing radio frequency and/or AC interference into the system.

Remember, you should snap a ferrite collar around each station cable to provide protection against radio frequency interference.

CAUTION

The polarity between the individual wires in a particular voice or data pair is not critical; however, do not connect the voice circuits to the data circuits.

3.1 Understanding Station Port Locations

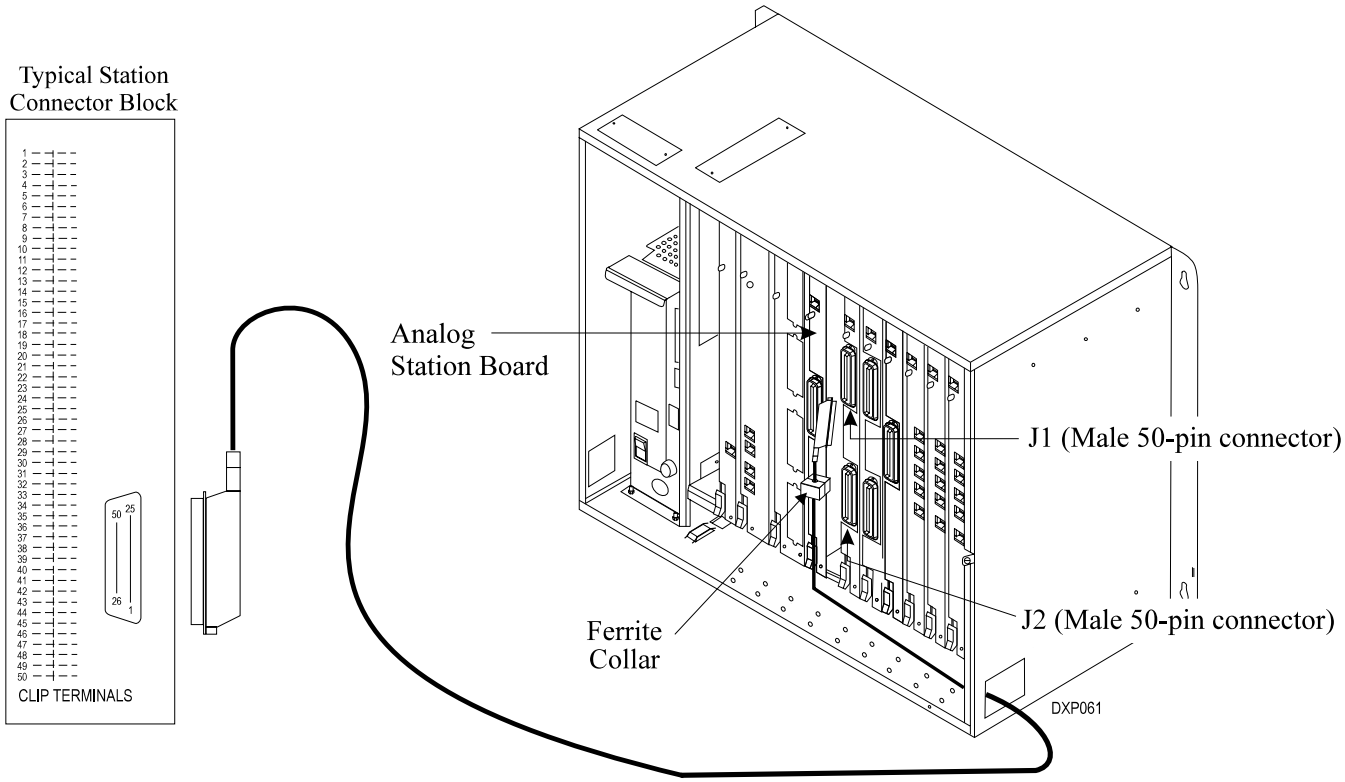
On 16–station boards, station ports 1–8 appear at connector J1and station ports 9–16 appear at connector J2 on every analog station board.

The station ports for both the main and expansion cabinet assend from the leftmost universal board slot. This means that in the main cabinet, station ports 1–16 are in the leftmost universal board slot, station ports 17–32 are in the next universal boatd slot to the right, station ports 33–48 are in the next universal board slot and so forth through station ports 65–80 located in universal board slot five. The main cabinet supports a totol of 80 stations. Remember, if the system requires auxiliary boards, you must install them at universal slots one and two thus eliminating two station board locations.

Station ports in the expansion cabinet begin at the leftmost board slots with station ports 81–96 and assend to the right at 16 station ports per slot to end at the rightmost universal slot with station ports 177–192. The expansion cabinet supports a total of 112 stations.

3.2 Understanding Station Pairing

Station ports are paired ODD/EVEN, beginning with the lowest directory number 101/102, 103/104, etc., for data and for overload protection. The odd port is the positive voltage (+) port and the even port is the negative voltage (-) port.



Viewing A Typical Station Connection

3.3 Detailing The Station Connections

3.3.1 Detailing Analog Station Board J1 Connections

25-Pair Connections For J1			Station Connections			Station Identification	
Wire Color	Pair	Pin No.	Clip Term.	Pair	Wire Color	Station	Location
White-Blue	1	26	1	Voice Path	Green	1	
Blue-White		1	2		Red		
White-Orange	2	27	3	Data Path	Yellow		
Orange-White		2	4		Black		
White-Green	3	28	5	Voice Path	Green	2	
Green-White		3	6		Red		
White-Brown	4	29	7	Data Path	Yellow		
Brown-White		4	8		Black		
White-Slate	5	30	9	Voice Path	Green	3	
Slate-White		5	10		Red		
Red-Blue	6	31	11	Data Path	Yellow		
Blue-Red		6	12		Black		
Red-Orange	7	32	13	Voice Path	Green	4	
Orange-Red		7	14		Red		
Red-Green	8	33	15	Data Path	Yellow		
Green-Red		8	16		Black		
Red-Brown	9	34	17	Voice Path	Green	5	
Brown-Red		9	18		Red		
Red-Slate	10	35	19	Data Path	Yellow		
Slate-Red		10	20		Black		
Black-Blue	11	36	21	Voice Path	Green	6	
Blue-Black		11	22		Red		
Black-Orange	12	37	23	Data Path	Yellow		
Orange-Black		12	24		Black		
Black-Green	13	38	25	Voice Path	Green	7	
Green-Black		13	26		Red		
Black-Brown	14	39	27	Data Path	Yellow		
Brown-Black		14	28		Black		
Black-Slate	15	40	29	Voice Path	Green	8	
Slate-Black		15	30		Red		
Yellow-Blue	16	41	31	Data Path	Yellow		
Blue-Yellow		16	32		Black		
Yellow-Orange	17	42	33	**The analog station board does not provide station connections on J1 connector pairs 17–25. Remember, you should connect all unused conductors in your house cable to earth ground.**			
Orange-Yellow		17	34				
Yellow-Green	18	43	35				
Green-Yellow		18	36				
Yellow-Brown	19	44	37				
Brown-Yellow		19	38				
Yellow-Slate	20	45	39				
Slate-Yellow		20	40				
Violet-Blue	21	46	41				
Blue-Violet		21	42				
Violet-Orange	22	47	43				
Orange-Violet		22	44				
Violet-Green	23	48	45				
Green-Violet		23	46				
Violet-Brown	24	49	47				
Brown-Violet		24	48				
Violet-Slate	25	50	49				
Slate-Violet		25	50				

3.3.2 Detailing Analog Station Board J2 Connections

25-Pair Connections For J2			*Station Connections*			*Station Identification*	
Wire Color	*Pair*	*Pin No.*	*Clip Term.*	*Pair*	*Wire Color*	*Station*	*Location*
White-Blue	1	26	1	Voice Path	Green	9	
Blue-White		1	2		Red		
White-Orange	2	27	3	Data Path	Yellow		
Orange-White		2	4		Black		
White-Green	3	28	5	Voice Path	Green	10	
Green-White		3	6		Red		
White-Brown	4	29	7	Data Path	Yellow		
Brown-White		4	8		Black		
White-Slate	5	30	9	Voice Path	Green	11	
Slate-White		5	10		Red		
Red-Blue	6	31	11	Data Path	Yellow		
Blue-Red		6	12		Black		
Red-Orange	7	32	13	Voice Path	Green	12	
Orange-Red		7	14		Red		
Red-Green	8	33	15	Data Path	Yellow		
Green-Red		8	16		Black		
Red-Brown	9	34	17	Voice Path	Green	13	
Brown-Red		9	18		Red		
Red-Slate	10	35	19	Data Path	Yellow		
Slate-Red		10	20		Black		
Black-Blue	11	36	21	Voice Path	Green	14	
Blue-Black		11	22		Red		
Black-Orange	12	37	23	Data Path	Yellow		
Orange-Black		12	24		Black		
Black-Green	13	38	25	Voice Path	Green	15	
Green-Black		13	26		Red		
Black-Brown	14	39	27	Data Path	Yellow		
Brown-Black		14	28		Black		
Black-Slate	15	40	29	Voice Path	Green	16	
Slate-Black		15	30		Red		
Yellow-Blue	16	41	31	Data Path	Yellow		
Blue-Yellow		16	32		Black		
Yellow-Orange	17	42	33				
Orange-Yellow		17	34				
Yellow-Green	18	43	35				
Green-Yellow		18	36				
Yellow-Brown	19	44	37				
Brown-Yellow		19	38				
Yellow-Slate	20	45	39				
Slate-Yellow		20	40				
Violet-Blue	21	46	41				
Blue-Violet		21	42				
Violet-Orange	22	47	43				
Orange-Violet		22	44				
Violet-Green	23	48	45				
Green-Violet		23	46				
Violet-Brown	24	49	47				
Brown-Violet		24	48				
Violet-Slate	25	50	49				
Slate-Violet		25	50				

The analog station board does not provide station connections on J2 connector pairs 17–25. Remember, you should connect all unused conductors in your house cable to earth ground.

3.4 Installing DSS/BLF Consoles

Install a DSS/BLF Console at any station port in the system as a companion to a system telephone.

- The DXP systems support a maximum of four consoles for each telephone and there is no limit to the maximum number of consoles that you can install on a system. Typically, the console capacity is equal to one-half of the total station capacity of the system.The installed distance limit between the station board and the console is the same as that allowed for an analog or digital telephone.
- When you install a DSS/BLF console, you must program define the station port as a console port.

3.5 Detailing Station Call Announce Parameters

The DXP systems place no limits (other that the distance constraints stated previously) on telephone placement and arrangement within the system; however, when placing telephones that require call announcing capability, consider the parameters detailed in this call announce matrix table.

Call Announce Matrix

Receive Call Announcements

Originate Call Announcements	Digital Speaker	Digital Monitor	Digital Single Line	Analog Speaker	Analog Monitor	Analog Single Line	PC Atten.	Scout 900MX	Industry Standard
Digital Speaker	YES	YES	NO	YES	NO	NO	NO	NO	NO
Digital Monitor	YES	YES	NO	YES	NO	NO	NO	NO	NO
Digital Single Line	YES	YES	NO	YES	NO	NO	NO	NO	NO
Analog Speaker	YES	YES	NO	YES	YES	NO	NO	NO	NO
Analog Monitor	YES	YES	NO	YES	YES	NO	NO	NO	NO
Analog Single Line	YES	YES	NO	YES	NO	NO	NO	NO	NO
PC Atten.	YES	YES	NO	YES	NO	NO	NO	NO	NO
Scout 900MX	YES	YES	NO	YES	NO	NO	NO	NO	NO
Industry Standar	YES	YES	NO	YES	NO	NO	NO	NO	NO

4.0 Installing Subdued Off-Hook Voice Announce (SOHVA) Wiring For Analog Stations

An analog multiline telephone has SOHVA capability built into it. This telephone contains a 6-position, 3-pair station jack for SOHVA connection.

To enable SOHVA as a system feature for analog stations,

- you must use 6-wire, twisted-pair house cable to connect two data-paired station ports to a 625A2-6 station jack,
- you must connect the SOHVA-capable analog multiline telephone to the 625A2-6 station jack using a 6-wire line cord,
- you must take programming action to configure the station ports to support SOHVA operation.

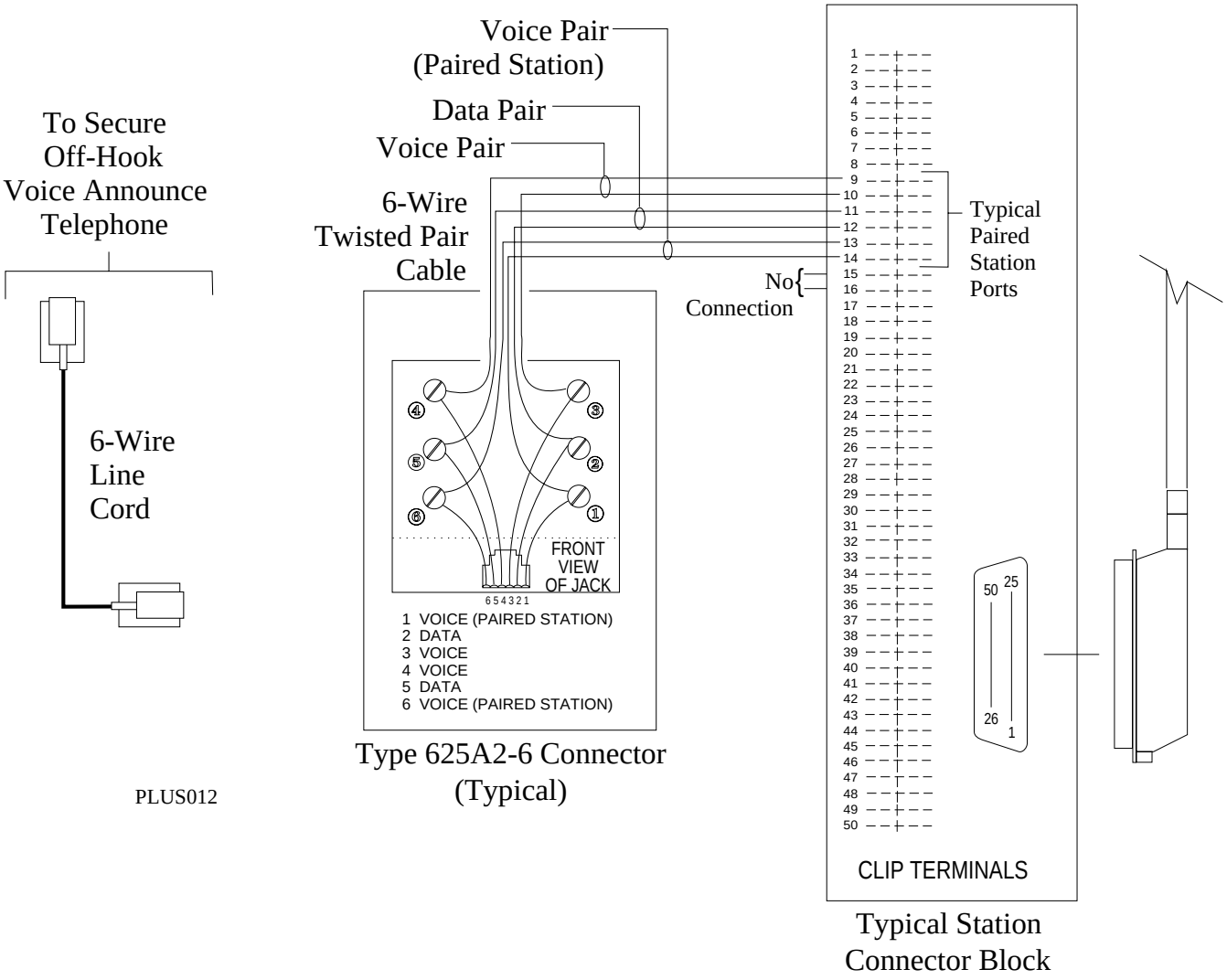
Make the installation per the following procedure:

1. Identify two data-paired ports on an analog station connector block (identify an odd-numbered port and its even-numbered counterpart such as ports 103 and 104).
2. Use 6-wire, twisted-pair house cable and make the following connections:
   (a) connect pins 3 and 4 (the inside pair) of a 625A2-6 station jack to the voice pair of the odd-numbered station port.

   (b) connect pins 2 and 5 (the outside pair) of the 625A2-6 station jack to the data pair of the odd-numbered station port,

   (c) connect pins 1 and 6 of the 625A2-6 station jack to the voice pair of the even-numbered stration port,

   (d) leave the data pair of the even-numbered station port vacant.
3. Using the Telephone Types programming selection from the stations programming menu, program the odd-numbered station port to support the type of telephone that you will install there. Program the even-numbered station port as UNDEFINED.



Making Off-Hook Voice Announce Telephone Connections

5.0 Testing The Analog Station Installation

5.1 Making A Resistance Check

Make the following resistance measurements at the station connector blocks under the following conditions.

- AC power cord disconnected from electrical outlet.
- External battery back-up assembly disconnected.
- Common equipment connected to station connector blocks.
- Stations wired and wiring punched down on blocks.
- Bridging clips removed from blocks to isolate stations from common equipment.

1. Measure the resistance of each installed station and wiring from the station side of the connector blocks. Resistance values will vary with cable length and station type but should be within the limits shown in the chart below.
2. Measure the resistance of the common equipment and cables from the common equipment side of the station connector blocks. Resistance values should be within the limits shown in the chart below.

Making Resistance Measurements				
Measured Pair	**Resistance In Ohms**			
	Multiline Telephone	**Single Line Telephone**	**DSS/BLF Console**	**Common Equipment**
Voice Pair	**40–150**	**40–150**	**0.3–100**	**40–50**
Data Pair	**0.3–100**	**0.3–100**	**0.3–100**	**1–2**

5.2 Making A Voltage Check

Make the following voltage measurements at the station connector blocks under the following conditions:

- Bridging clips installed
- AC power connected to the common equipment

Measure the voltage across one voice line and one data line and then across the other voice line and the other data line for each even and odd station. The measured voltage must be within the limits shown in the chart below.

Making Voltage Measurements			
Station Under Test	**66M-xx Block Connection**	**Meter Lead Polarity**	**Measured Voltage**
Odd Station	**Voice 1**	**+**	**+ 34 +/-3 VDC**
	Data 3	**-**	
	Voice 2	**+**	**+ 34 +/- 3 VDC**
	Data 4	**-**	
Even Station	**Voice 5**	**+**	**+ 34 +/- 3 VDC**
	Data 7	**-**	
	Voice 6	**+**	**+ 34 +/- 3 VDC**
	Data 8	**-**	
Varriant readings can indicate a possible wiring error or a station or common equipment problem.			

5.3 Causing An Analog Station To Self Test

You can cause analog multiline stations to self test for proper operation per the following instructions:

1. Disconnect line cord at station base.

NOTE: The adjacent odd or even station will be disabled during the time that the station line cord is being disconnected or reconnected.

2. Press and hold MUTE and reconnect line cord to station connector. Station will automatically perform self test routine.
3. Release MUTE as soon as test begins. Sequence of test is as follows:

(a.) Indicators will light in sequence
(b.) Indicators will then turn off at the same time
(c.) Ringer will sound—be sure to set station ringer volume to medium or high setting

4. Replace any station that does not pass the self test.

5.4 Causing A DSS/BLF Console To Self Test

You can cause the DSS/BLF Consoles to self test for proper operation as follows:

1. Disconnect console line cord plug from line.
2. Press and hold console button C10 while reconnecting line cord plug to line.

NOTE: The companion station will be disabled during the time that the console is being disconnected and reconnected.

3. Release console button C10, and note that BLF indicators will each turn on in sequence beginning with station 10 indicator. Indicators will then turn off and console will become operational.

5.5 Understanding The Failure Indications

If erratic light indications or ring signals occur at a paired station, an open data pair at either station may be the fault. A station with an open data line may work properly on a short loop but fail on a long loop.

Stations are paired for overload current protection. If a fault occurs that causes more than 300 milliamps of current to be drawn, the overload paired stations are disabled by circuit action. Disconnect the disabled stations and reconnect them one at a time to isolate the faulty one.

The Station board status light conveys the following information:

Rapid flash = malfunctioning micro-controller
Off with repeated 5 second blink on = normal operation with all stations idle
On with repeated 5 second blink off = normal operation with at least one station busy
Steady on or steady off = board malfunction

COMDIAL®

Installing The Digital Station Board In The DXP Digital Communications System

1.0 Introducing The Digital Station Boards

The digital station board supports the operation of both the DigiTech and Impact digital multiline telephones.

1.1 Inventorying The Digital Station Boards

There are two models of station boards available for use.

- Eight-station model supports eight DigiTech or Impact multiline and single line proprietary digital telephones
- 16-station model supports 16 DigiTech or Impact multiline and single line proprietary digital telephones

1.2 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

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The information contained herein does not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.
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2.0 Installing Circuit Boards

CAUTION

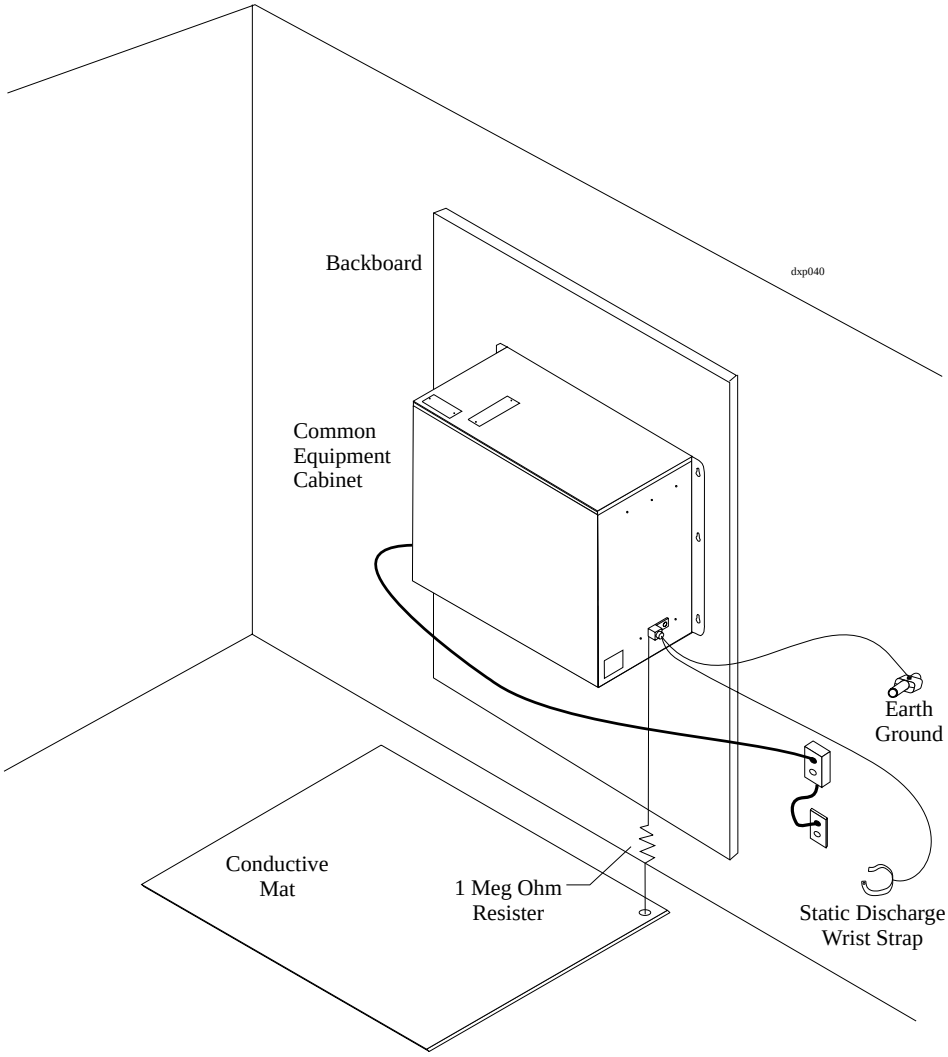
Circuit boards are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, for general information. Specific handling precautions are also included in this installation instruction.

2.1 Creating A Static Safe Work Area

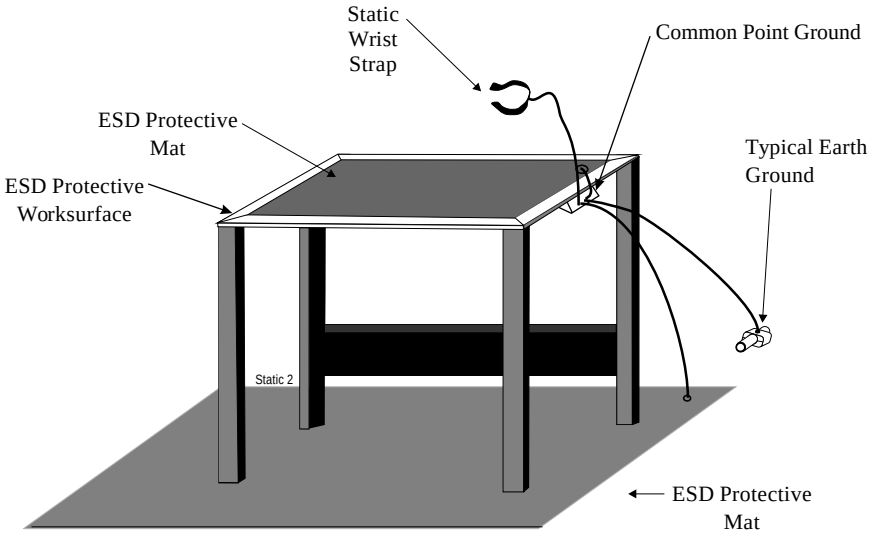
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

2.2 Installing Station Boards In The Equipment Cabinet

1. Normally you should disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply; however, when necessary, you can install a station board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the precharge port on the power supply. During step 5, you will connect the other end of this coil cord to the precharge jack on the station board.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

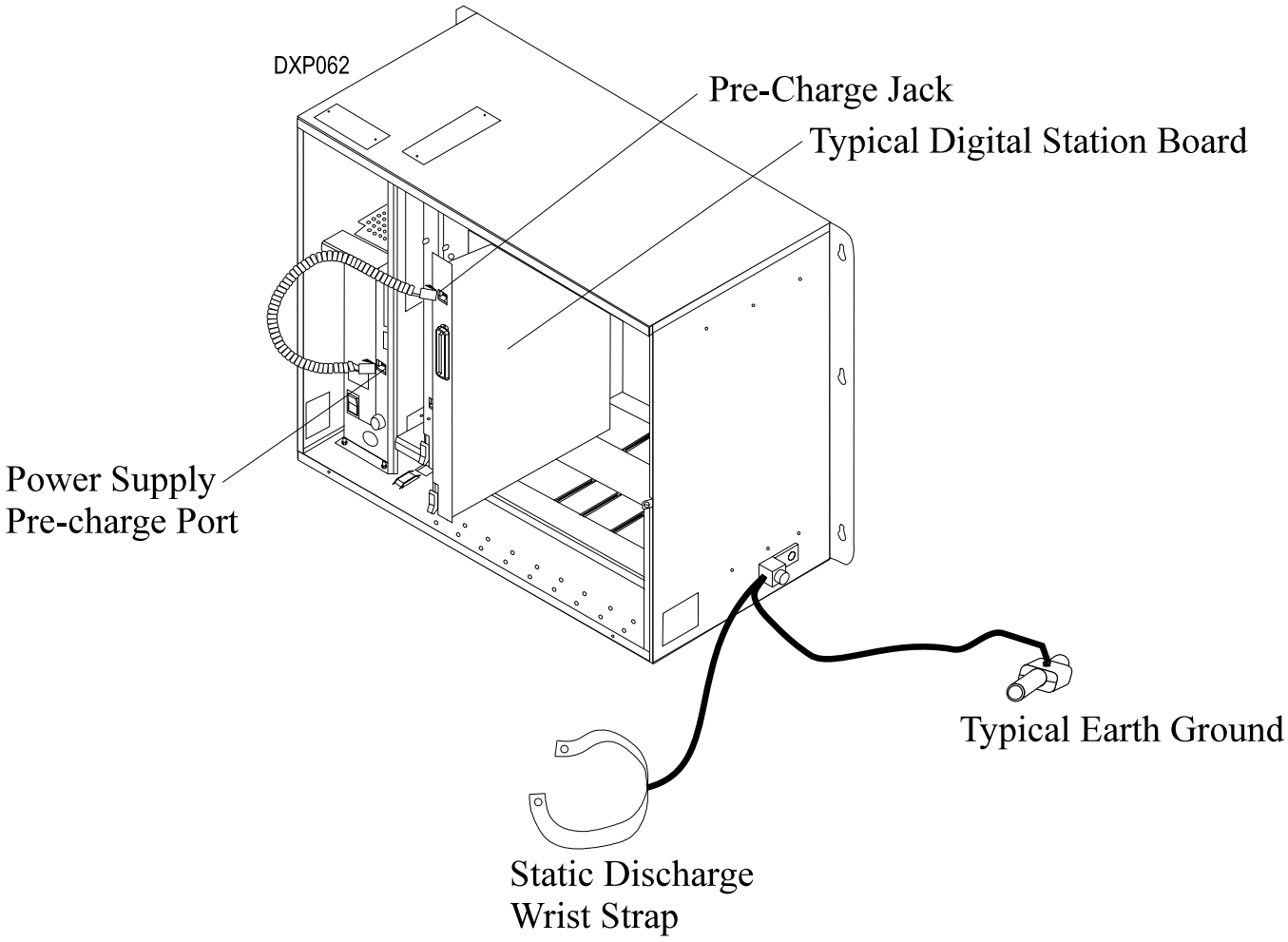
NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. Each station board is supplied in a static protection bag for safe keeping. When you are ready to install the circuit board, remove it from its static protection bag.
4. Locate the proper board slot.
   - In DXP main cabinets, the station boards connect to universal slots 3 through 5. You can connect station boards in universal slots 1 and 2; however, you occupy the only slots that are available for auxiliary boards.
   - In DXP expansion cabinets, the station boards connect to any universal board slot.
5. If you are installing the station board in an operating system, connect the free end of the precharge cord that you installed in step 1 to the precharge jack on the station board.
6. Orient the station board with its top and bottom guides in main cabinet board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane.

CAUTION

When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

7. Repeat steps 3 and 4 until all circuit boards are installed.
8. Make a final inspection to ensure that all circuit boards are, oriented correctly and mated properly.
9. Install and tighten the supplied screws to secure the circuit boards to the board cage.
10. Each station board includes a ferrite collar. Snap the ferrite collar around the cable station to provide protection against radio frequency interference.



Viewing A Typical Station Board Installation

3.0 Connecting The Stations

Connections between the telephone stations and the common equipment station boards are typically via type 66M-xx connector blocks that are cable connected to 50-pin male connectors on the station boards.

The American Wire Gauge (AWG) size of the station wiring determines the maximum distance allowed from the common equipment to the stations. The following chart details this relationship.

Station Type	Wire Gauge		
	20 AWG	22 AWG	24 AWG
Digital Telephone	2500 Feet	2000 Feet	1500 Feet

If spare conductors exist in the cables that you run between the station boards and the 66M-xx connector blocks, it is a good practice to connect the spare conductors to earth ground. Doing this may help prevent the spare connectors from inducing radio frequency and/or AC interference into the system.

Remember, you should snap a ferrite collar around each station cable to provide protection against radio frequency interference.

3.1 Understanding Station Port Locations

On 16–station boards, station ports 1–16 appear at connector J1

The station ports for both the main and expansion cabinet assend from the leftmost universal board slot. This means that in the main cabinet, station ports 1–16 are in the leftmost universal board slot, station ports 17–32 are in the next universal boatd slot to the right, station ports 33–48 are in the next universal board slot and so forth through station ports 65–80 located in universal board slot five. The main cabinet supports a totol of 80 stations. Remember, if the system requires auxiliary boards, you must install them at universal slots one and two thus eliminating two station board locations.

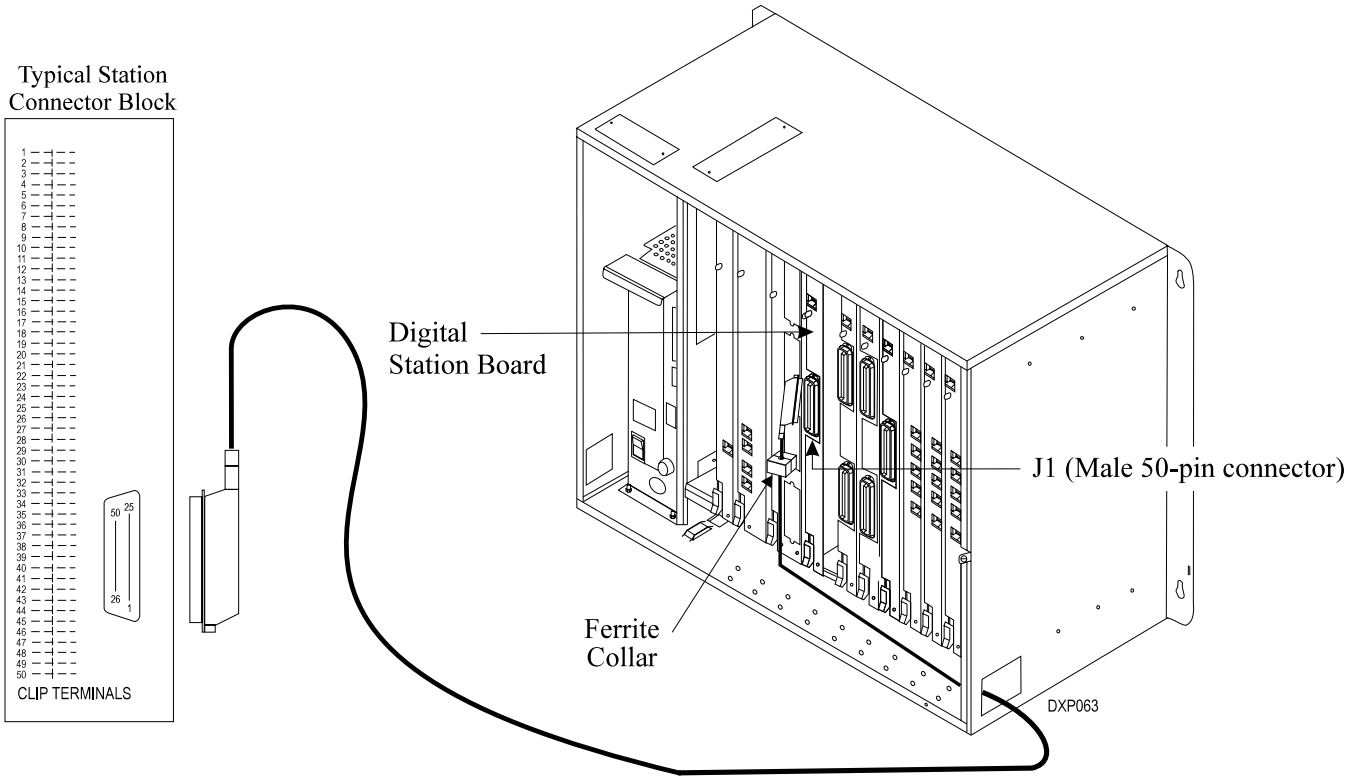
Station ports in the expansion cabinet begin at the leftmost board slots with station ports 81–96 and assend to the right at 16 station ports per slot to end at the rightmost universal slot with station ports 177–192. The expansion cabinet supports a total of 112 stations.

3.2 Installing DSS/BLF Consoles

Install a DSS/BLF Console at any station port in the system as a companion to a system telephone.

- The DXP systems support a maximum of four consoles for each telephone and there is no limit to the maximum number of consoles that you can install on a system. Typically, the console capacity is equal to one-half of the total station capacity of the system.
- The installed distance limit between the station board and the console is the same as that allowed for an analog or digital telephone.

When you install a DSS/BLF console, you must program define the station port as a console port.



Viewing A Typical Station Connection

3.3 Detailing The Station Connections

3.3.1 Detailing Digital Station Board Connections

25-Pair Connections			Station Pair Connections			Station Identification	
Wire Color	Pair	Pin No.	Clip Term.	Pair Identification	Wire Color	Station	Location (note the site position in this column)
White-Blue	1	26	1	Signal Path	Green	1	
Blue-White		1	2		Red		
White-Orange	2	27	3	Signal Path	Yellow	2	
Orange-White		2	4		Black		
White-Green	3	28	5	Signal Path	Green	3	
Green-White		3	6		Red		
White-Brown	4	29	7	Signal Path	Yellow	4	
Brown-White		4	8		Black		
White-Slate	5	30	9	Signal Path	Green	5	
Slate-White		5	10		Red		
Red-Blue	6	31	11	Signal Path	Yellow	6	
Blue-Red		6	12		Black		
Red-Orange	7	32	13	Signal Path	Green	7	
Orange-Red		7	14		Red		
Red-Green	8	33	15	Signal Path	Yellow	8	
Green-Red		8	16		Black		
Red-Brown	9	34	17	Signal Path	Green	9	
Brown-Red		9	18		Red		
Red-Slate	10	35	19	Signal Path	Yellow	10	
Slate-Red		10	20		Black		
Black-Blue	11	36	21	Signal Path	Green	11	
Blue-Black		11	22		Red		
Black-Orange	12	37	23	Signal Path	Yellow	12	
Orange-Black		12	24		Black		
Black-Green	13	38	25	Signal Path	Green	13	
Green-Black		13	26		Red		
Black-Brown	14	39	27	Signal Path	Yellow	14	
Brown-Black		14	28		Black		
Black-Slate	15	40	29	Signal Path	Red	15	
Slate-Black		15	30		Green		
Yellow-Blue	16	41	31	Signal Path	Yellow	16	
Blue-Yellow		16	32		Black		
Yellow-Orange	17	42	33				
Orange-Yellow		17	34				
Yellow-Green	18	43	35				
Green-Yellow		18	36				
Yellow-Brown	19	44	37				
Brown-Yellow		19	38				
Yellow-Slate	20	45	39				
Slate-Yellow		20	40				
Violet-Blue	21	46	41				
Blue-Violet		21	42				
Violet-Orange	22	47	43				
Orange-Violet		22	44				
Violet-Green	23	48	45				
Green-Violet		23	46				
Violet-Brown	24	49	47				
Brown-Violet		24	48				
Violet-Slate	25	50	49				
Slate-Violet		25	50				

The digital station board does not provide station connections on connector pairs 17–25. Remember, you should connect all unused conductors in your house cable to earth ground.

3.4 Detailing Station Call Announce Parameters

The DXP systems place no limits (other that the distance constraints stated previously) on telephone placement and arrangement within the system; however, when placing telephones that require call announcing capability, consider the parameters detailed in the call announce matrix table.

Call Announce Matrix

Receive Call Announcements

Originate Call Announcements	**Digital Speaker**	**Digital Monitor**	**Digital Single Line**	**Analog Speaker**	**Analog Monitor**	**Analog Single Line**	**PC Atten.**	**Scout 900MX**	**Industry Standard**
Digital Speaker	**YES**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**
Digital Monitor	**YES**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**
Digital Single Line	**YES**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**
Analog Speaker	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**	**NO**	**NO**	**NO**
Analog Monitor	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**	**NO**	**NO**	**NO**
Analog Single Line	**YES**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**
PC Atten.	**YES**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**
Scout 900MX	**YES**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**
Industry Standard	**YES**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**

4.0 Testing The Digital Station Installation

During operation, the station board's status light conveys the following information:

Rapid flash = malfunctioning micro-controller
Off with repeated 5 second blink on = normal operation with all stations idle
On with repeated 5 second blink off = normal operation with at least one station busy
Steady on or steady off = board malfunction

4.1 Making A Resistance Check

Measure the resistance at the station connector blocks under the following conditions.

- AC power cord disconnected from electrical outlet.
- Common equipment connected to station connector blocks.
- Stations wired and wiring punched down on blocks.
- Bridging clips removed from blocks to isolate stations from common equipment.

Measure the resistance of each installed station and wiring from the station side of the connector blocks. Resistance values will vary with cable length and station type but should be within the following limits:

✔ Greater than 700 Kohms

Measure the resistance of the common equipment and cables from the common equipment side of the station connector blocks. The resistance value should be within the following limits.

✔ 40–50 Ohms

4.2 Making A Voltage Check

Make the following voltage measurements at the station connector blocks under the following conditions:

- Bridging clips installed
- AC power connected to the common equipment

Measure the voltage across the signal pair. The measured voltage must be within the following limits:

✔ 28–36 VDC

4.3 Causing A Digital Station To Self Test

The multiline stations can be self tested for proper operation per the following instructions:

1. Disconnect line cord at station base.
2. Press and hold MUTE and reconnect line cord to station connector. Station will automatically perform self test routine.
3. Release MUTE as soon as test begins. Sequence of test is as follows:
   - (a.) Indicators will light in sequence
   - (b.) Ringer will sound - be sure volume is set to low or high
   - (c.) Indicators and ringer will then turn off at the same time
4. Replace any station that does not pass the self test.



Comdial's Quality Management System Is Certified To The ISO 9001 Standard.

COMDIAL®

Installing An Industry-Standard Telephone Station Board In The DXP Digital Communications System

1.0 Understanding Industry-Standard Telephone Support

The DXP digital communications system supports the use of on-premise industry-standard telephones (IST) through IST station interface boards. IST installations require a ring generator assembly—one required for the main common equipment cabinet and another one in the expansion common equipment cabinet if you install IST station boards there. Plus, IST installations may require a dual tone multiple frequency (DTMF) receiver card if additional DTMF receivers are required beyond the one provided by the CPU board.

1.1 Detailing The Necessary Equipment

Regardless of the number of industry-standard telephones that you plan to install, you will need to install the following equipment:

- at least one IST station interface board,
- one ring generator assembly for each equipment cabinet that will contain IST station interface boards,
- at least one line interface circuit board

The DXP CPU board provides on-board DTMF receiver circuitry capable of supporting simultaneous dialing of two industry-standard telephones at a time. This provision is adequate if your site requires only a few industry-standard telephones; however, if you intend to support a population of industry-standard telephones that will generate a large volume of outgoing call traffic, you may need to install one or more DTMF receiver cards to provide additional DTMF receivers for the telephones. Each receiver card allows four ISTs to dial simultaneously. The number of cards that you need to install in the system depends upon how active the ISTs will be at the site. See section 1.2 for complete details.

If you do need to add receiver cards, add one or two auxiliary boards to the system and install up to four DTMF receiver cards on each one.

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1.2 Determining The Board Configuration That You Will Need

Use the following specifications to determine the maximum number of station boards and DTMF receiver cards that you may need.

- Each eight-station circuit board supports up to eight telephones. (It will actually support 16 telephones—two telephones at each port sharing a common intercom number.)
  - You can bridge up to two industry-standard telephones at one station port as long as you do not exceed a combined ringer equivalence number, or REN, of 2.0. (Remember, with two telephones at the same port, they share a common intercom number.)
- Each 16-station circuit board supports up to 16 telephones. (It will actually support 32 telephones—two telephones at each port sharing a common intercom number)
  - You can bridge up to two industry-standard telephones at one station port as long as you do not exceed a combined ringer equivalence number, or REN, of 2.0. (Remember, with two telephones at the same port, they share a common intercom number.)
- Each receiver card allows four industry-standard telephones to dial simultaneously. (The number of cards that you need to install in the system will depend upon how active the industry-standard telephones will be at the site.)
  - You can install four receiver cards on a auxiliary board. With four receiver cards installed, an auxiliary board supports simultaneous dialing of 16 industry-standard telephones (Remember, while you can install up to two auxiliary boards in the system, each auxiliary board that you use occupies a slot where you could install a station or line board.)

Based upon the above specifications, a fully-equipped DXP system provides the following industry-standard telephone support:

- a maximum of 352 industry-standard telephones (11 IST station boards times 16 telephones per board times two telephones per station port —sharing the same extension number) with a maximum of 18 telephones dialing simultaneously (four DTMF receiver cards times one auxiliary board times four DTMF receiver circuits per card plus the two DTMF receiver circuits that are always provided by the CPU board),
- a maximum of 320 industry-standard telephones (10 IST station boards times 16 telephones per board times two telephones per station port —sharing the same extension number) with a maximum of 34 telephones dialing simultaneously (eight DTMF receiver cards times two auxiliary boards plus the two CPU board supplied DTMF receiver circuits).

A typical telephone system, experiences the following call traffic percentages. Your system may be similar.

- Light Call Traffic = up to 15 percent of the telephones dial simultaneously
- Moderate Call Traffic = up to 20 percent of the telephones dial simultaneously
- Heavy Call Traffic = up to 30 percent of the telephones dial simultaneously

If you are not sure how many telephones will dial at the same time in your system, you can use these typical system averages and the following formula to arrive at a usable estimate.

(Percent Of Simultaneous Dialing) x (Installed IST Telephones) = (Simultaneous Dialing Telephones)

An an example the system maximum is as follows: .106 x 320 = 34 telephones

You can use the following formula to determine how many receiver cards that you must install in your system.

$$\frac{\text{(Simultaneous Dialing Telephones) – (2 Telephone Supported By CPU Board)}}{\text{(4 Telephones Supported Per Receiver Card)}} = \text{Total Number Of Receiver Cards}$$

As an example, the system maximum is as follows: (34 – 2) ÷ 4 = 8 cards

The following chart details typical hardware configurations for IST installations:

Call Traffic	Telephone Quantity	IST Board Quantity	Auxiliary Board Quantity	Receiver Card Quantity	Simultaneous Dialing
Light	16	1	0*	0*	2
Moderate	16	1	0*	0*	2
Heavy	16	1	1	1	6
Light	32	2	1	1	6
Moderate	32	2	1	1	6
Heavy	32	2	1	2	10
Light	48	3	1	2	10
Moderate	48	3	1	2	10
Heavy	48	3	1	3	14
Light	64	4	1	3	14
Moderate	64	4	1	3	14
Heavy	64	4	1	4	18
Light	80	5	1	4	18
Moderate	80	5	1	4	18
Heavy	80	5	2	5	22
Light	96	6	2	5	22
Moderate	96	6	2	5	22
Heavy	96	6	2	6	26
Light	112	7	2	6	26
Moderate	112	7	2	7	26
Heavy	112	7	2	7	30
Light	128	8	2	7	30
Moderate	128	8	2	7	30
Heavy	128	8	2	8	30
Light	144	9	2	8	34
Moderate	144	9	2	8	34
Heavy	144	9	2	8	34
Light	160	10	2	8	34
Moderate	160	10	2	8	34
Heavy	160	10	2	8	34
Light	176	11	1	4	18
Moderate	176	11	1	4	18
Heavy	176	11	1	4	18

*The CPU board provides DTMF receivers that allow up to two industry-standard telephones to dial simultaneously.

1.3 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

2.0 Installing Circuit Boards

CAUTION

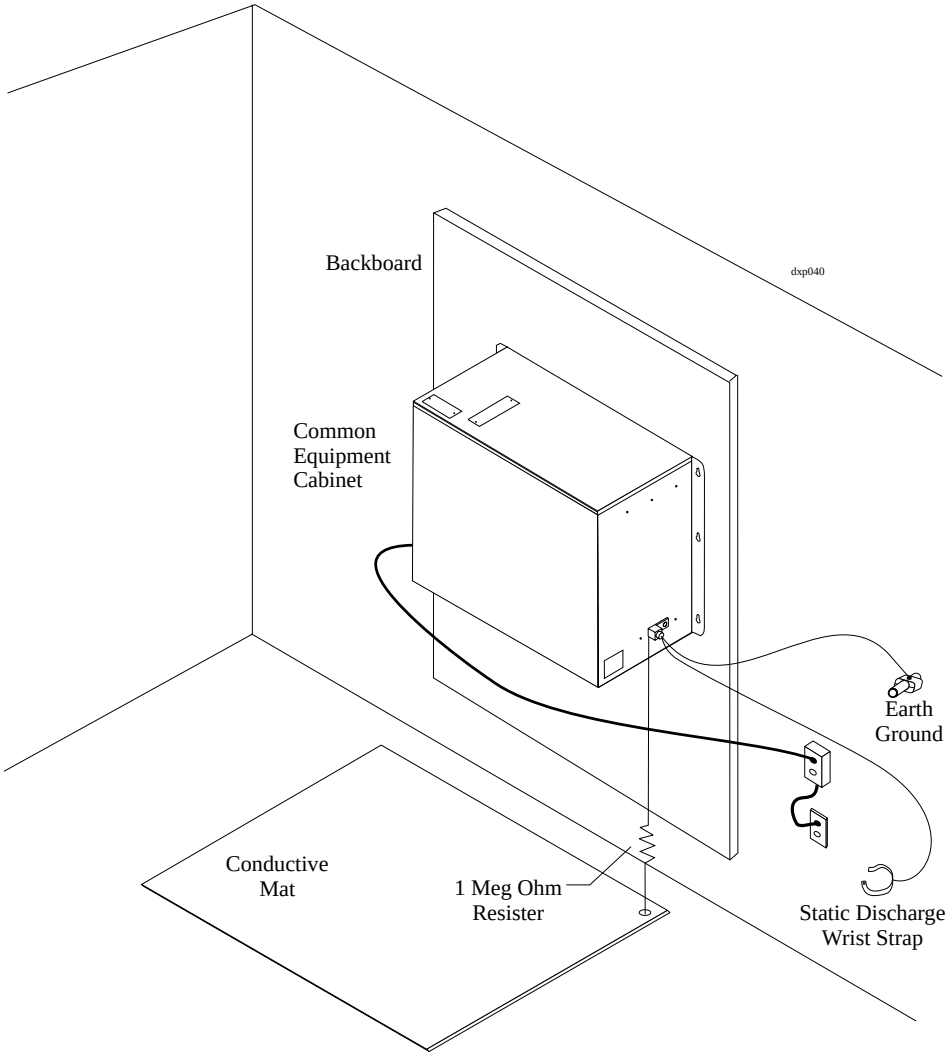
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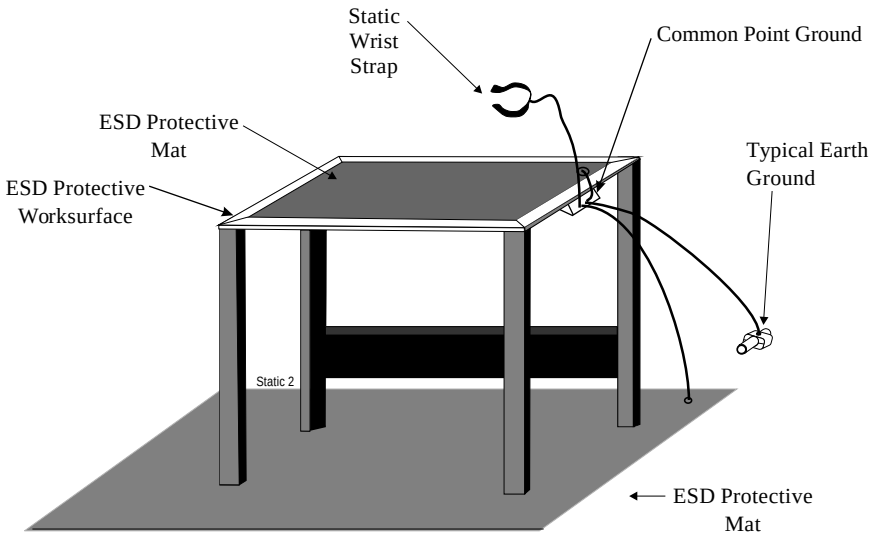
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

2.2 Installing IST Station Boards In The Equipment Cabinet

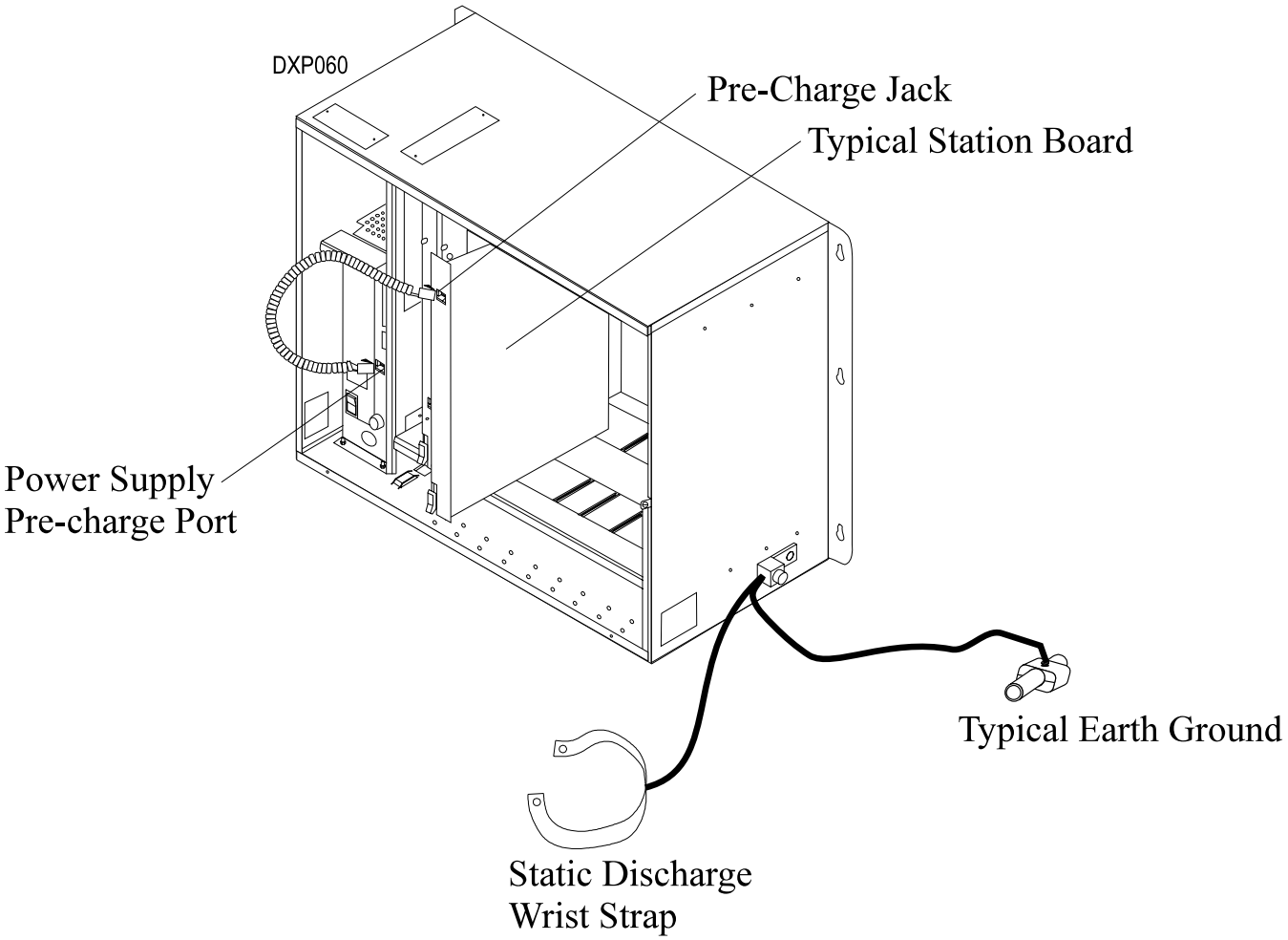
1. Normally you should first disconnect the optional battery back-up equipment from the power supply and then disconnect the AC power cord from the AC outlet; however, when necessary, you can install a station board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the precharge port on the power supply. During step 5, you will connect the other end of this coil cord to the precharge jack on the station board.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. Loosen the retaining hardware and lift the front panel away from the common equipment cabinet.
4. Each station board is supplied in a static protection bag for safe keeping. When you are ready to install the circuit board, remove it from its static protection bag.
5. Locate the proper board slot.
   - In DXP main cabinets, the station boards connect to universal slots 3 through 5. You can connect station boards in universal slots 1 and 2; however, you occupy the only slots that are available for auxiliary boards.
   - In DXP expansion cabinets, the station boards connect to any universal board slot.
6. If you are installing the station board in an operating system, connect the free end of the precharge cord that you installed in step 1 to the precharge jack on the station board.
7. Orient the station board with its top and bottom guides in main cabinet board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane. If you connected a handset cord between the pre-charge port on the power supply and the jack on the circuit board, disconnect the cord after installing the board.

   CAUTION

   When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.
8. Repeat steps 3 and 4 until all circuit boards are installed.
9. Make a final inspection to ensure that all circuit boards are, oriented correctly and mated properly.
10. Install and tighten the supplied screws to secure the circuit boards to the board cage.
11. Each station board includes a ferrite collar. Snap the ferrite collar around the cable station to provide protection against radio frequency interference.
12. If your installation requires additional DTMF receivers, add receiver cards by following the instructions included with the card.
13. If the cabinet where you installed the IST station boards does not now include a ring generator assembly, install a ring generator assembly by following the instructions included with the assembly.
14. Plug the AC line cord into the AC outlet, reconnect any battery back up equipment, and turn on the switch on the power supply.
15. Replace the front panel on the common equipment cabinet.



Viewing A Typical Station Board Installation

3.0 Connecting The Stations

Connections between the telephone stations and the common equipment station boards are typically via type 66M-xx connector blocks that are cable connected to 50-pin male connectors on the station boards.

The maximum distance allowed from the common equipment to the industry-standard telephone varies with the gauge of wire that you use to make the connection. Refer to the following chart for complete details.

Station Type	Wire Gauge		
	20 AWG	22 AWG	24 AWG
Industry-Standard Telephones	4000 Feet	3500 Feet	3000 Feet

The maximum distances stated above are dependent upon the following conditions:

- resistance of industry-standard telephone (per EIA specs) cannot exceed 300 ohms maximum,
- DC load resistance of the wiring between the common equipment and the industry-standard telephone Plus the DC resistance of telephone itself can not exceed 460 ohms maximum.

If spare conductors exist in the cables that you run between the station boards and the 66M-xx connector blocks, it is a good practice to connect the spare conductors to earth ground. Doing this may help prevent the spare connectors from inducing radio frequency and/or AC interference into the system.

Remember, you should snap a ferrite collar around each station cable to provide protection against radio frequency interference.

CAUTION

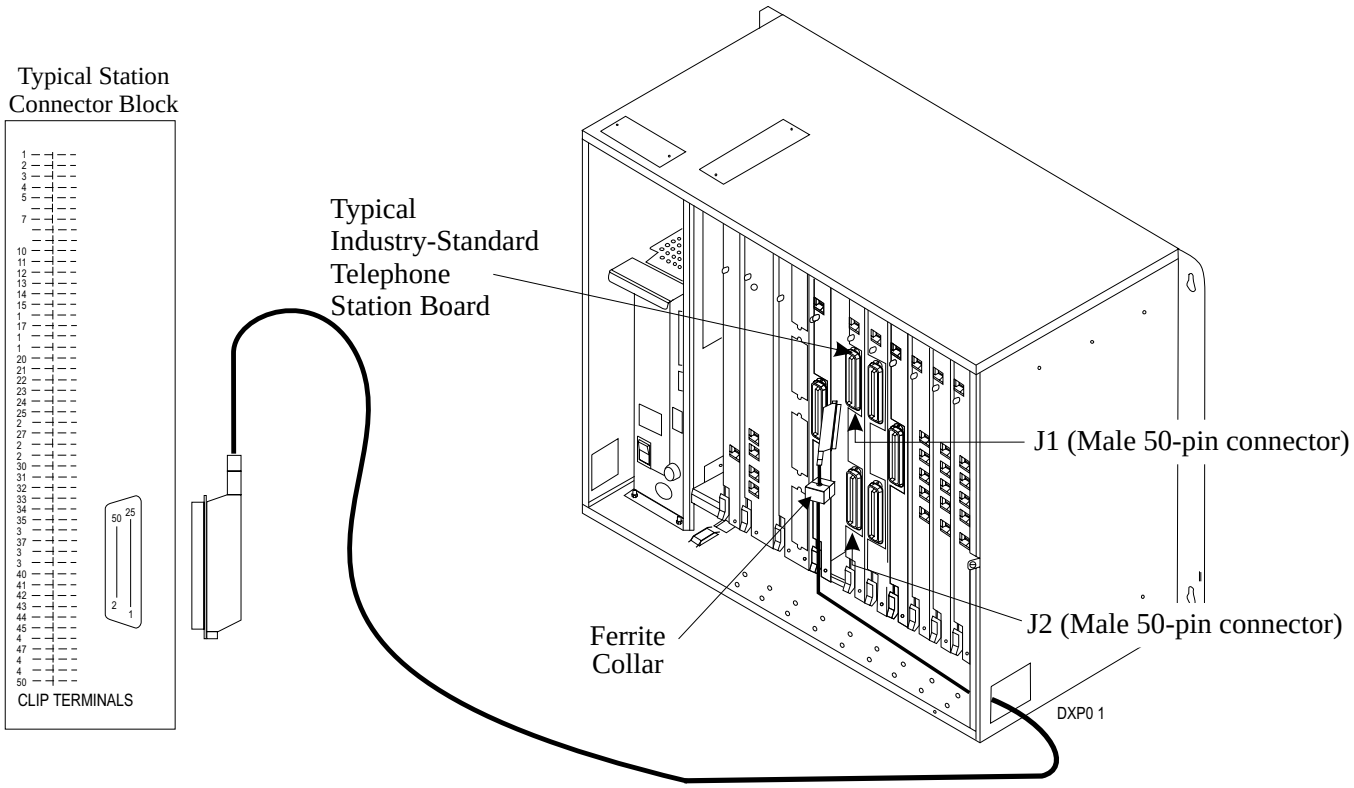
The polarity between the individual wires in a particular voice pair is not critical.

3.1 Understanding Station Port Locations

On 16–station boards, station ports 1–8 appear at connector J1 and station ports 9–16 appear at connector J2.

The station ports for both the main and expansion cabinet assend from the leftmost universal board slot. This means that in the main cabinet, station ports 1–16 are in the leftmost universal board slot, station ports 17–32 are in the next universal board slot to the right, station ports 33–48 are in the next universal board slot and so forth through station ports 65–80 located in universal board slot five. The main cabinet supports a total of 80 stations. Remember, if the system requires auxiliary boards, you must install them at universal slots one and two thus eliminating two station board locations.

Station ports in the expansion cabinet begin at the leftmost board slots with station ports 81–96 and assend to the right at 16 station ports per slot to end at the rightmost universal slot with station ports 177–192. The expansion cabinet supports a total of 112 stations.



Connecting Telephones To The IST Station Board

3.2 Detailing The Station Connections For J1

25-Pair Connections			Two-Wire Connections			Station Connections	
Wire Color	Pair	Pin No.	Clip Term.	Pair	Wire Color	Station	Location
White-Blue	1	26	1	Tip Lead	Green	1	
Blue-White		1	2	Ring Lead	Red		
White-Orange	2	27	3	No connection			
Orange-White		2	4				
White-Green	3	28	5				
Green-White		3	6				
White-Brown	4	29	7	Tip Lead	Green	2	
Brown-White		4	8	Ring Lead	Red		
White-Slate	5	30	9	No connection			
Slate-White		5	10				
Red-Blue	6	31	11				
Blue-Red		6	12				
Red-Orange	7	32	13	Tip Lead	Green	3	
Orange-Red		7	14	Ring Lead	Red		
Red-Green	8	33	15	No connection			
Green-Red		8	16				
Red-Brown	9	34	17				
Brown-Red		9	18				
Red-Slate	10	35	19	Tip Lead	Green	4	
Slate-Red		10	20	Ring Lead	Red		
Black-Blue	11	36	21	No connection			
Blue-Black		11	22				
Black-Orange	12	37	23				
Orange-Black		12	24				
Black-Green	13	38	25	Tip Lead	Green	5	
Green-Black		13	26	Ring Lead	Red		
Black-Brown	14	39	27	No connection			
Brown-Black		14	28				
Black-Slate	15	40	29				
Slate-Black		15	30				
Yellow-Blue	16	41	31	Tip Lead	Green	6	
Blue-Yellow		16	32	Ring Lead	Red		
Yellow-Orange	17	42	33	No connection			
Orange-Yellow		17	34				
Yellow-Green	18	43	35				
Green-Yellow		18	36				
Yellow-Brown	19	44	37	Tip Lead	Green	7	
Brown-Yellow		19	38	Ring Lead	Red		
Yellow-Slate	20	45	39	No connection			
Slate-Yellow		20	40				
Violet-Blue	21	46	41				
Blue-Violet		21	42				
Violet-Orange	22	47	43	Tip Lead	Green	8	
Orange-Violet		22	44	Ring Lead	Red		
Violet-Green	23	48	45	No connection			
Green-Violet		23	46				
Violet-Brown	24	49	47				
Brown-Violet		24	48				
Violet-Slate	25	50	49				
Slate-Violet		25	50				

3.3 Detailing The Station Connections For J2

25-Pair Connections			*Two-Wire Connections*			*Station Connections*	
Wire Color	*Pair*	*Pin No.*	*Clip Term.*	*Pair*	*Wire Color*	*Station*	*Location*
White-Blue	1	26	1	Tip Lead	Green	**9**	
Blue-White		1	2	Ring Lead	Red		
White-Orange	2	27	3	**No connection**			
Orange-White		2	4				
White-Green	3	28	5				
Green-White		3	6				
White-Brown	4	29	7	Tip Lead	Green	**10**	
Brown-White		4	8	Ring Lead	Red		
White-Slate	5	30	9	**No connection**			
Slate-White		5	10				
Red-Blue	6	31	11				
Blue-Red		6	12				
Red-Orange	7	32	13	Tip Lead	Green	**11**	
Orange-Red		7	14	Ring Lead	Red		
Red-Green	8	33	15	**No connection**			
Green-Red		8	16				
Red-Brown	9	34	17				
Brown-Red		9	18				
Red-Slate	10	35	19	Tip Lead	Green	**12**	
Slate-Red		10	20	Ring Lead	Red		
Black-Blue	11	36	21	**No connection**			
Blue-Black		11	22				
Black-Orange	12	37	23				
Orange-Black		12	24				
Black-Green	13	38	25	Tip Lead	Green	**13**	
Green-Black		13	26	Ring Lead	Red		
Black-Brown	14	39	27	**No connection**			
Brown-Black		14	28				
Black-Slate	15	40	29				
Slate-Black		15	30				
Yellow-Blue	16	41	31	Tip Lead	Green	**14**	
Blue-Yellow		16	32	Ring Lead	Red		
Yellow-Orange	17	42	33	**No connection**			
Orange-Yellow		17	34				
Yellow-Green	18	43	35				
Green-Yellow		18	36				
Yellow-Brown	19	44	37	Tip Lead	Green	**15**	
Brown-Yellow		19	38	Ring Lead	Red		
Yellow-Slate	20	45	39	**No connection**			
Slate-Yellow		20	40				
Violet-Blue	21	46	41				
Blue-Violet		21	42				
Violet-Orange	22	47	43	Tip Lead	Green	**16**	
Orange-Violet		22	44	Ring Lead	Red		
Violet-Green	23	48	45	**No connection**			
Green-Violet		23	46				
Violet-Brown	24	49	47				
Brown-Violet		24	48				
Violet-Slate	25	50	49				
Slate-Violet		25	50				

4.0 Checking Out The Installation And Isolating Failures

During operation, the station board's status light conveys the following information:

Rapid flash = malfunctioning micro-controller
Off with repeated 5 second blink on = normal operation with all stations idle
On with repeated 5 second blink off = normal operation with at least one station busy
Steady on or steady off = board malfunction

4.1 Voltage Check

Make the following voltage measurements at the station connector blocks under the following conditions:

- Common equipment connected to station connector blocks.
- Stations wired and wiring punched down on blocks.
- Bridging clips installed
- AC power connected to the common equipment

Measure the DC voltage across the Tip and Ring leads for each installed telephone with a DC voltmeter. Then, call the industry-standard telephone to stimulate the ring generator assembly and measure the AC ringing voltage across the Tip and Ring leads for each installed telephone with an AC voltmeter.

The measured voltages must be within the limits shown in the chart below. If your measured readings are different from these charted values, it could indicate a possible wiring error or a station or common equipment problem.

66M-xx Connector	*Meter Lead Polarity*	*Measured DC Volts*	*Measured AC Ring Voltage*
Tip Lead	**+**	**+ 36 ± 3 VDC**	**70 ± 5 VAC**
Ring Lead	**-**		

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Installing The Loop Start Line Board In The DXP Digital Communications System

1.0 Introducing The Loop Start Line Board

1.1 Defining Loop Start

The line board signals for the host system to complete a line connection by sending a supervisory signal to the host system. Typically this signal is the hookflash that occurs when a user takes a telephone off hook on the line. The line board transmits this signal to the host system by placing a resistance across the line's tip and ring leads to complete a current loop. When the host system senses this resistance, it sends dial tone over the line thus giving line service to the system.

1.2 Inventorying The Loop Start Line Boards

There are two versions of the loop start line board. One version interfaces four central office lines and the other version interfaces eight central office lines.

1.3 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch un-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

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2.0 Installing Circuit Boards In The Equipment Cabinet

CAUTION

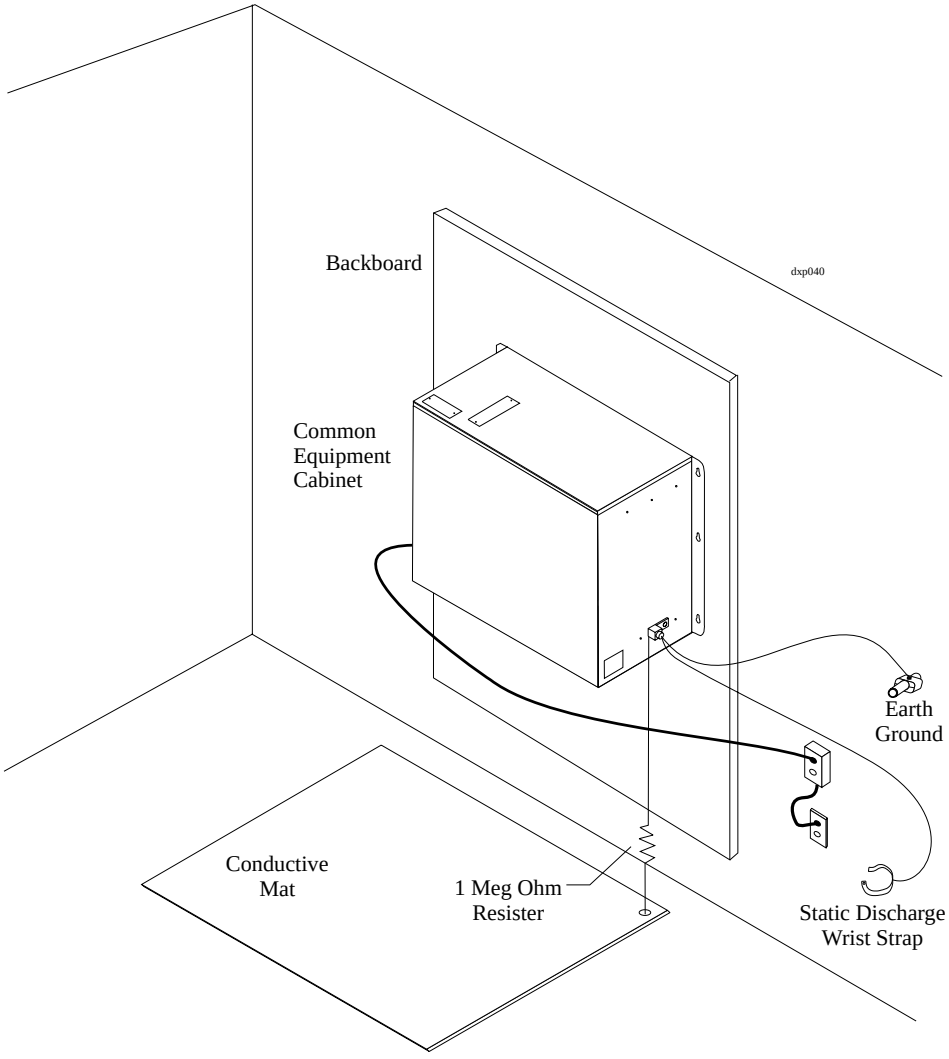
Circuit boards are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, for general information. Specific handling precautions are also included in this installation instruction.

2.1 Creating A Static Safe Work Area

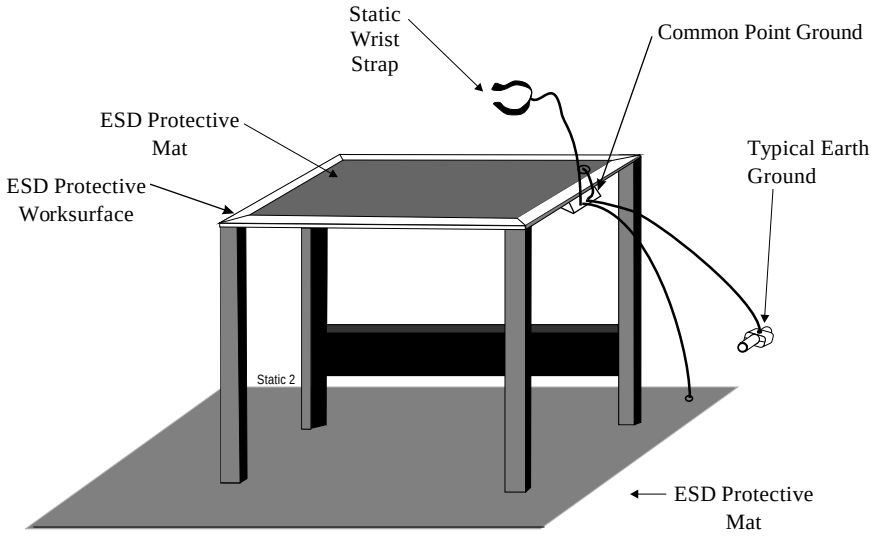
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

2.2 Installing Loop Start Line Boards

1. Normally you should disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply; however, when necessary, you can install a line board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the precharge port on the power supply. During step 5, you will connect the other end of this coil cord to the precharge jack on the line board.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. Each circuit board is supplied in a static protection bag for safe keeping. When you are ready to install the circuit board, remove it from its static protection bag.
4. Locate the proper board slot.
   - In DXP main cabinets, the loop start line boards normally connect to line slots 1–4 and universal slots 3–5. You can connect line boards in universal slots 1 and 2; however, you occupy the only two slots that are available for auxiliary boards.
   - In DXP expansion cabinets, the loop start line boards connect to any universal board slot.
5. If you are installing the line board in an operating system, connect the free end of the precharge cord that you installed in step 1 to the precharge jack on the line board.
6. Orient the circuit board with its top and bottom guides in main cabinet board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane.

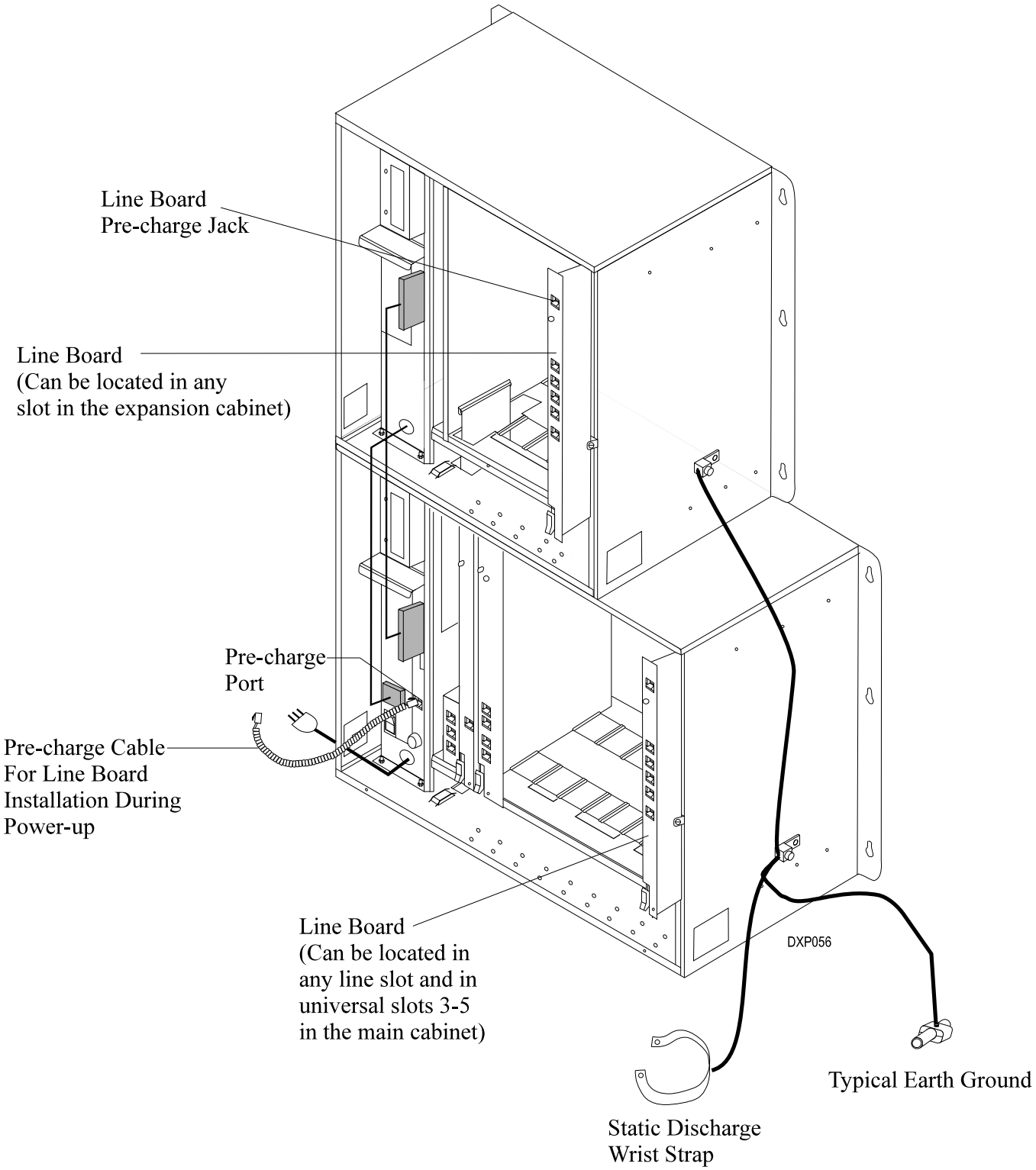
CAUTION

When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

7. Repeat steps 3 and 4 until all circuit boards are installed.
8. Make a final inspection to ensure that all circuit boards are, oriented correctly and mated properly.
9. Install and tighten the supplied screws to secure the circuit boards to the board cage.
10. Each line board includes a ferrite collar. Bundle the line cables together and snap the ferrite collar around the cable bundle to provide protection against radio frequency interference.

Operating line boards provide the following status light indications:

Line Boards	Rapid flash = malfunctioning line board processor
	Off with repeated 5 second blink on = normal operation with all lines idle
	On with repeated 5 second blink off = normal operation with at least one line busy



Viewing A Typical Line Board Installation

3.0 Connecting The Telephone Lines

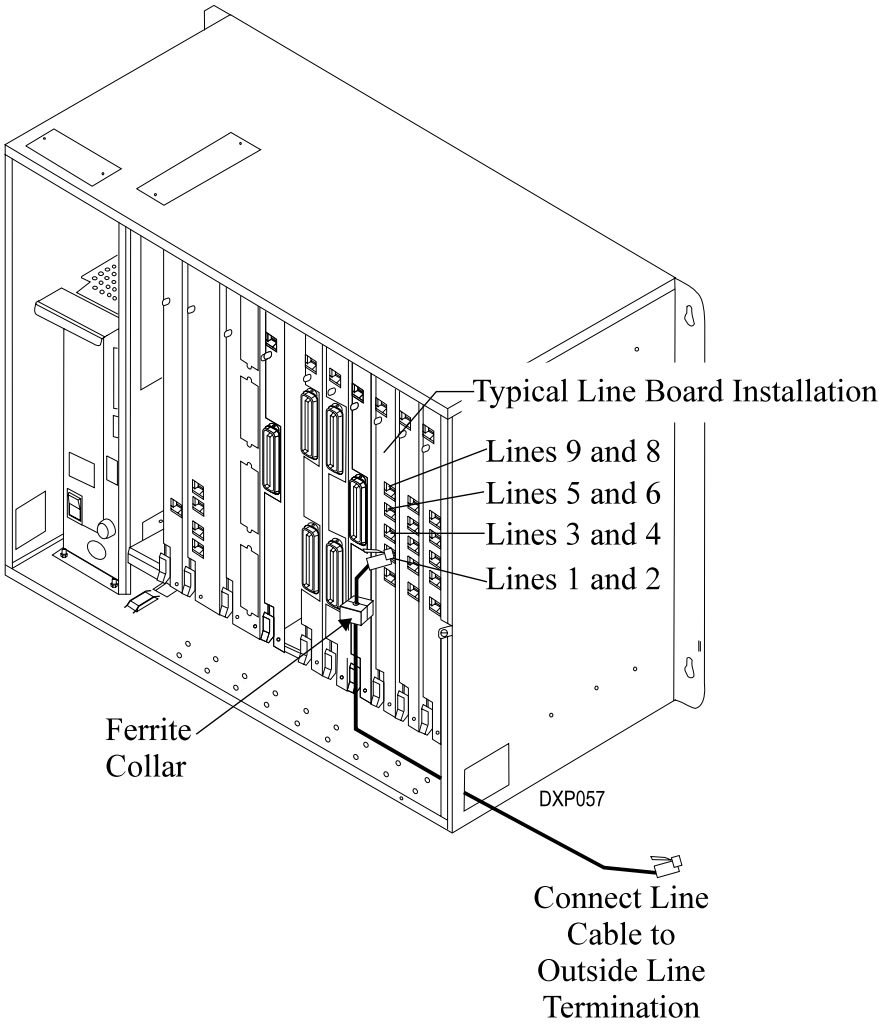
The line terminations on the line board are standard modular plug/jack connections. Each modular jack provides termination for two lines. The line outside termination can be a type 66M-xx connector block or individual 6-position modular jacks. The wiring that is routed between the outside termination and the common equipment circuit board termination should be twisted-pair wiring.

Remember, each line board is shipped with a ferrite collar. Bundle the line cables together and snap the collar around the bundle to provide protection against radio frequency interference.

The line numbers on every board ascend from the bottom line jack (lines 1, 2) to the top line jack (lines 7, 8).

The line ports for both the main and expansion cabinet ascend from the rightmost slot to the leftmost slot. This means that in the main cabinet, line ports 1–8 are in the rightmost board slot, line ports 9–17 are in the next slot to the left, line ports 18–26 are in the next slot and so forth through line ports 65–72 located in the leftmost universal slot. The main cabinet supports a total of 72 lines.

Line ports in the expansion cabinet begin at the rightmost board slots with line ports 73–80 and ascend to the left at eight line ports per slot to end at the leftmost universal slot with line ports 121–128. The expansion cabinet supports a total of 56 lines.



Viewing A Typical Line Connection

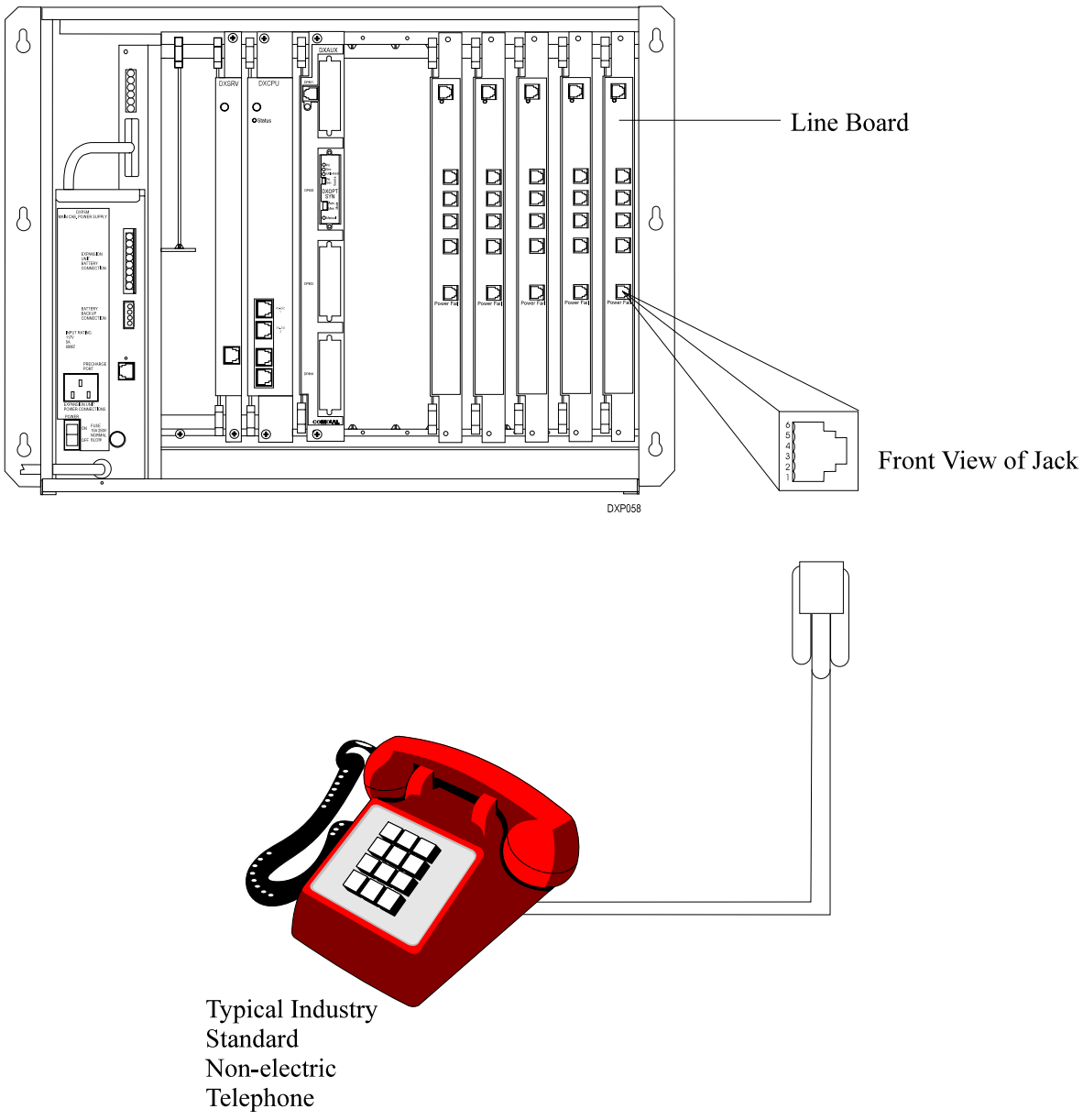
Detailing The Line Board Connections

Line Jack	*Pin Number*	*Connection*	*Telephone Number*
1	**1**	No Connection	
	2	Line 8 Tip	
	3	Line 7 Tip	
	4	Line 7 Ring	
	5	Line 8 Ring	
	6	No Connection	
2	**1**	No Connection	
	2	Line 6 Tip	
	3	Line 5 Tip	
	4	Line 5 Ring	
	5	Line 6 Ring	
	6	No Connection	
3	**1**	No Connection	
	2	Line 4 Tip	
	3	Line 3 Tip	
	4	Line 3 Ring	
	5	Line 4 Ring	
	6	No Connection	
4	**1**	No Connection	
	2	Auxiliary (Line 2) Tip	
	3	Line 1 Tip	
	4	Line 1 Ring	
	5	Line 2 Ring	
	6	Auxiliary (Line 2) Ring	
5	**1**	No Connection	
	2	No connection	
	3	Power Fail (Line 1) Ring	
	4	Power Fail (lIne1) Tip	
	5	No Connection	
	6	No Connection	

NOTE: If the system operation includes the direct inward station access (DISA) feature on a particular line, callers that use DISA to access a trunk group and place calls (trunk to trunk calling) may experience low audio levels on their calls due to the normal line resistance of CO lines. Low audio level is usually only noticeable on long line loops. If signal loss is a problem at your site, try adding a line amplifier (repeater) in the DISA line. Comdial does not recommend DISA for use on loop start lines without disconnect supervision. While DISA will function, Comdial will not be liable for its performance under any condition where disconnect supervision is not provided.

4.0 Making A Power Failure Station Connection

Every loop start line board provides a tip and ring pair connected to line 1 as an emergency power failure circuit. This power fail circuit is active during a commercial AC power failure if an external battery assembly is not installed to provide battery back-up power to the system. Connect an industry standard, single-line telephone to the power failure jack and use it to provide basic communications capability until the AC power to the system is restored. The bottom jack on the line board provides the power failure connection.

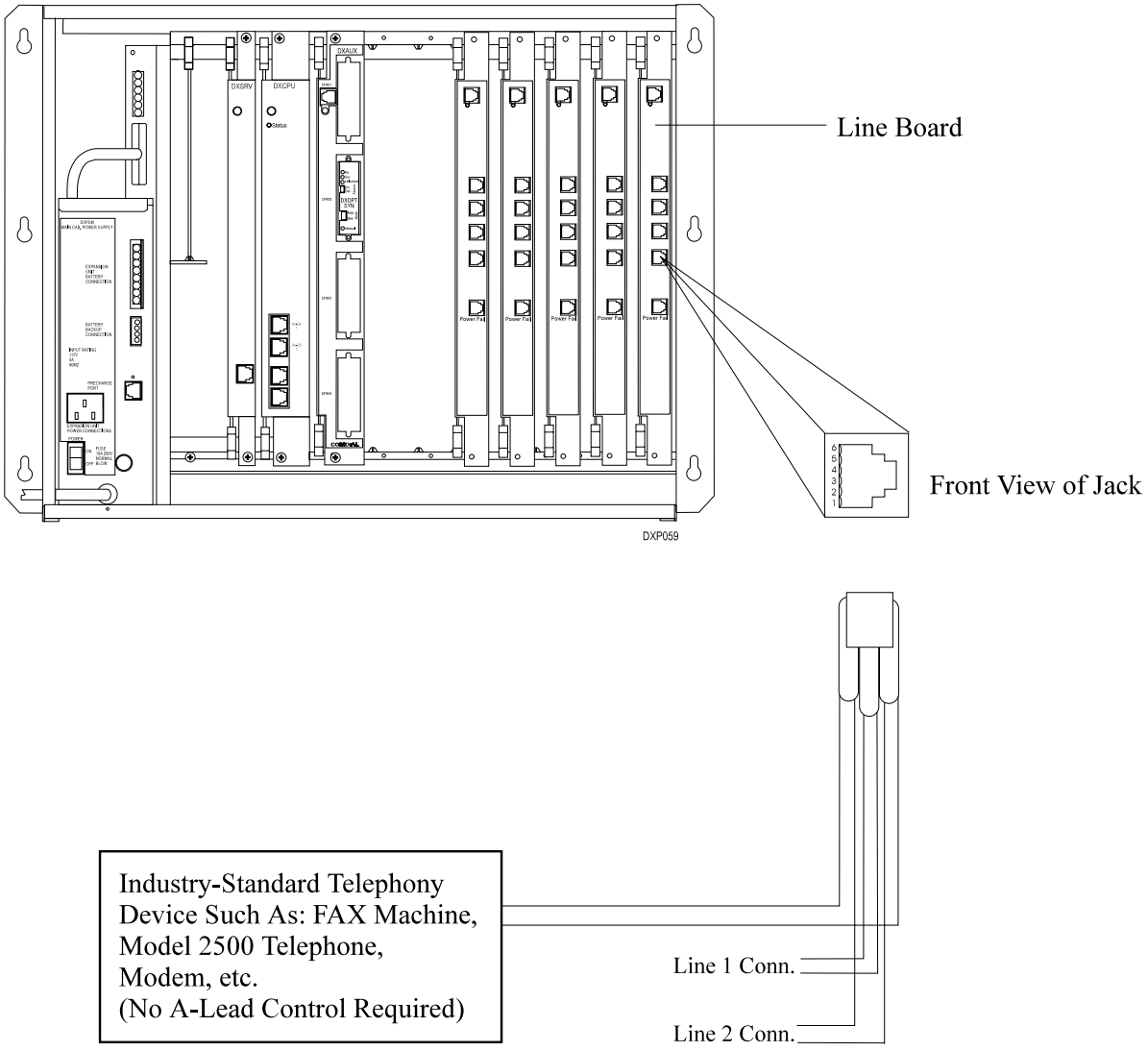


Making A Power Failure Station Connection

5.0 Making An Auxiliary Equipment Interface Connection (Busy Lead Detection)

When needed, connect an industry standard non-electronic telephone device such as a FAX machine, an industry-standard telephone, or a data device, such as a modem, on a line ahead of the common equipment. The system will detect an off-hook condition in the connected device and turn on the status light for the line at the system telephones to indicate that the line is busy.

Each line board makes one auxiliary equipment connection available for use. This connection is at pins 1 and 6 of the lines 1,2 jack and is associated with line 2 of that line board.


Line Board
Front View of Jack
DXP059
Industry-Standard Telephony Device Such As: FAX Machine, Model 2500 Telephone, Modem, etc.
(No A-Lead Control Required)
Line 1 Conn.
Line 2 Conn.

Making A Typical Auxiliary Interface Connection

COMDIAL®

Installing The Direct Inward Dialing (DID) Line Board In The DXP Digital Communications System

1.0 Understanding The DID Line Board

1.1 Describing Direct Inward Dialing Parameters

Direct inward dial (DID) lines are incoming only and are employed to reduce the number of channels between the DXP and the Central Office (CO). The number of DID lines that the system accepts is limited only by the number of installed DID boards that you can install in the system.

Direct inward dialing allows incoming CO calls to reach internal intercom extensions by direct dialing. No attendant assistance is necessary. Since DID lines are incoming only, their direct appearance is limited to attendant stations where busy indication may be useful.

DID operation requires a group of published directory numbers (400 maximum) provided by the CO. These directory numbers are incoming only and the DXP translates them to the appropriate personal or group intercom number for ringing. The lines will accept outgoing DTMF digits while the call is active to support personal identification number dialing and similar user purposes.

The DXP handles DID calls in the same manner that it handles regular intercom calls and will forward them via a hunt list or a call forwarding scheme. An unanswered DID call that receives no answer will either continue to ring or route to a programmed ring no-answer (RNA) destination. If there is no forwarding or the RNA routing destination is available, the system provides no routing.

Users can place DID calls on hold; however, if they press TAP, the system will generate an internal hookflash signal instead of one that the CO will recognize.

The system returns a ring back signal to DID calls made to a station in the do not disturb (DND) mode of operation.

When a DID line is disabled, the system returns an off-hook indication to the CO. This prevents the CO from placing calls on a disabled line.

The synchronized ringing feature does not have any affect on DID calls, and the Caller ID feature is not available on DID lines.

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1.2 Understanding DID Operation

The DID line is a reverse battery, loop start, two-wire voice circuit. (The term reverse battery means that it is the DXP and not the CO that provides tip and ring supervisory battery for the loop.) The PBX supervision battery, tone address, supervisory tones, and voice signals are transmitted across the voice pair. The line interface at the DXP provides loop current detection, loop pulse digit collection, DTMF receivers, and a polarity reversal circuit.

In the idle state, the loop is open at the CO end, with on-hook battery polarity maintained on the circuit by the DXP. The CO requests service from the DXP by applying a resistive termination across the line tip and ring leads. The DXP recognizes current flow in the loop as a CO connection and prepares for the incoming call. The CO does not send ringing since the DXP generates it internally and sends it to the stations.

After the DXP receives all of the address digits, it will translate the digits based on the appropriate DID block translation table and attempt to place the call to the desired station. To assure that the caller will always hear ring back prior to the call being answered (for example, when answered by voice mail), the system delays the station ringing until it applies ring back tone.

During station ringing, the called station will sound a distinctive ringing based on the ring code in the translation table. If the translation table has a name for this CO digit string, the LCD of the called stations will display that name. Otherwise, the DID block name will display followed by a portion of the CO digit string. If there is neither CO digit string name nor DID block name programmed, the station LCD will display just the CO digit string.

If an incoming call is addressed to either an unassigned or an uninstalled station, the DXP will route the call to the DID block alternate extension. If the DID Block alternate extension is unavailable, it routes the call to the Dial 0 attendant. If the Dial 0 attendant is either unprogrammed or uninstalled, the DXP will return reorder tone to the caller.

The system returns several different call progress signals to the CO in the interval after it receives address signalling and before it answers. It does this within 1.5 seconds after completion of address signalling.

Line Busy Tone: This tone indicates called station is busy or already being alerted by another call.

Reorder Tone: This tone indicates that the call cannot be completed due to:
blocking or lack of equipment,
an incomplete (partial dial) address is received.

Audible Ringing Tone: This tone indicates that the station is being alerted or that a recorded announcement will follow. The ring back will precede the actual alerting of the station to assure that the caller always hears some portion of the ring back tone.

When a called station answers, the DXP sends answer supervision to the CO by applying reverse polarity to the line. This polarity reversal is maintained until either the station goes on-hook or the CO opens the loop. The DXP establishes a communication path between the line and station when it detects station answer.

The CO signals a line disconnect condition to the DXP by opening the loop. When the DXP detects the CO disconnect, it returns the line to idle polarity and changes the line from busy to idle.

The DXP signals a line disconnect condition to the CO by returning the supervision battery polarity to the on-hook state. Wink and delay start lines maintain the busy status until the DXP detects CO release. After disconnect, the DXP returns to the idle state and is ready to process the next call.

With the Wink Start line, the DXP acknowledges that is ready to receive addressing digits from the CO by giving a momentary reversal of polarity after it has successfully allocated the resources.

With the Delay Start line, the DXP reverses polarity upon notification from the CO of the pending incoming call, then acknowledges that is ready to receive addressing digits by returning the polarity back to the idle state after it has successfully allocated the resources.

With the Immediate Start line, there is no acknowledgment from the DXP that it is ready. It is best to only use this method if the system is set for pulse (rotary) dialing on the line.

2.0 Installing Circuit Boards In The Equipment Cabinet

CAUTION

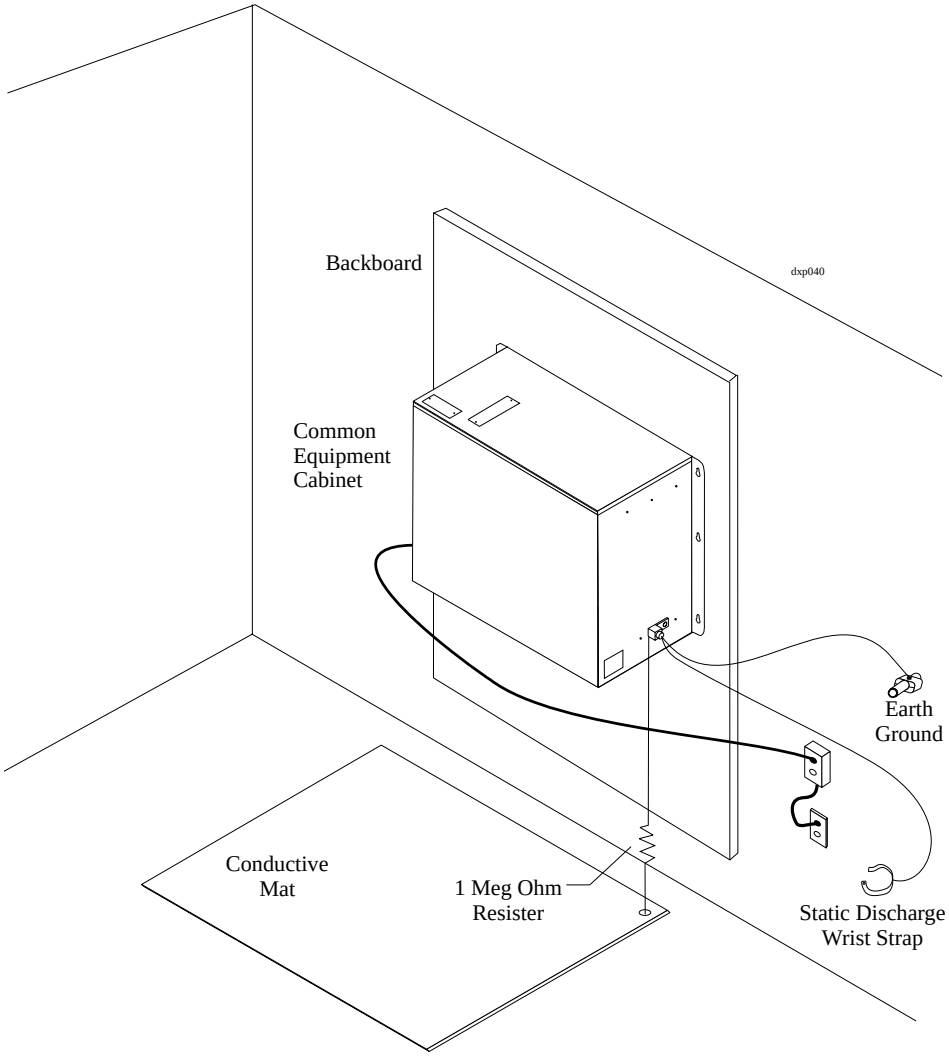
Circuit boards are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, for general information. Specific handling precautions are also included in this installation instruction.

2.1 Creating A Static Safe Work Area

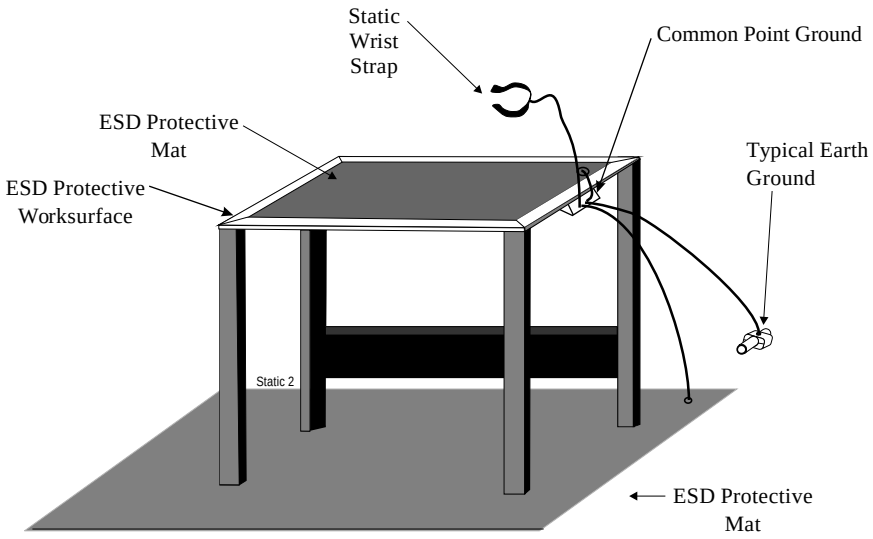
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

2.2 Installing DID Line Boards

1. Normally you should first disconnect the optional battery back-up assembly from the main cabinet power supply and then disconnect the AC power cord from the AC outlet; however, when necessary, you can install a DID line board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the precharge port on the power supply. During step 6, you will connect the other end of this coil cord to the precharge jack on the line board.

2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

3. Loosen the retaining hardware and lift the front panel away from the common equipment cabinet.

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

4. Each DID line board is supplied in a static protection bag for safe keeping. When you are ready to install the board, remove it from its static protection bag.

5. Locate the proper board slot.
   - In DXP main cabinets, the loop start line boards normally connect to line slots 1–4 and universal slots 3–5. You can connect line boards in universal slots 1 and 2; however, you occupy the only two slots that are available for auxiliary boards.
   - In DXP expansion cabinets, the loop start line boards connect to any universal board slot.

6. If you are installing the line board in an operating system, connect the free end of the precharge cord that you installed in step 1 to the precharge jack on the line board.

7. Orient the DID line board with its top and bottom guides in main cabinet board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane. If you connected handset cord between pre-charge port on DXP power supply and jack on DID line board (as directed in step 6), disconnect it after installing board.

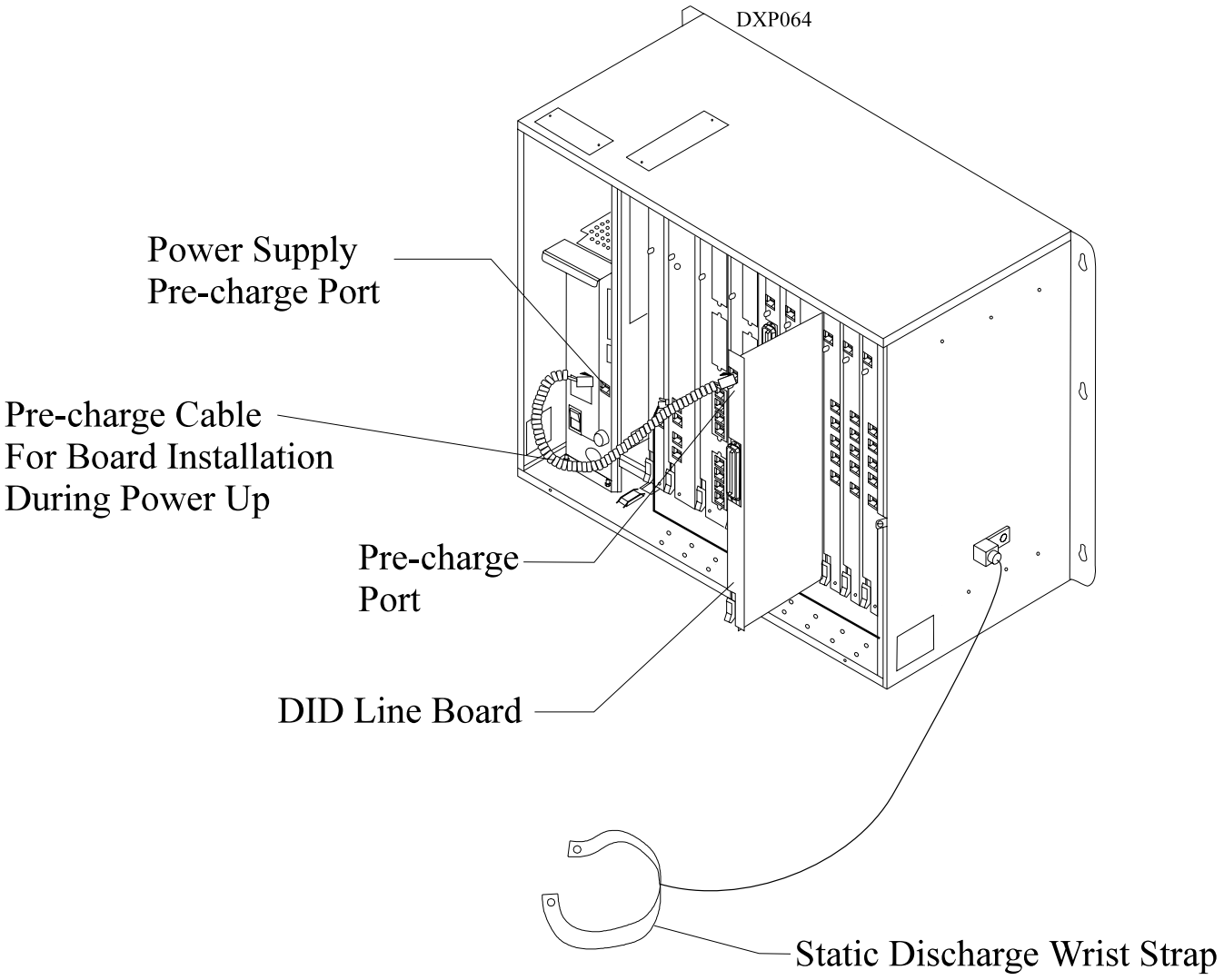
   CAUTION

   When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

8. Repeat steps 3 and 4 until all DID line boards are installed.

9. Make a final inspection to ensure that all boards are, oriented correctly and mated properly.

10. Install and tighten the supplied screws to secure the circuit boards to the board cage.
    Do not neglect this step! It is important because it helps in providing a protective ground condition for the board.



Installing The DID Line Board

3.0 Connecting The DID Lines

The FCC specified jack configuration for DID line connection to the switched network is a universal service order code (USOC) **RJ21X type** and the facility interface code for DID is **02RV2-T**. This specified connection is typically a type 66M-nn connector block.

CAUTION

When connecting the lines for DID applications, be sure that you do not reverse the tip and ring leads.

A 50-pin connector on the DID line board provides its line terminations. You can cable connect the DID board to the CO line termination with a prepared cable that matches the termination requirements. Snap the supplied ferrite collar around the cable to provide protection against radio frequency interference.

Before you connect the CO-supplied DID lines to the board, program the system for DID operation, and test the DID line ports per the steps shown below.

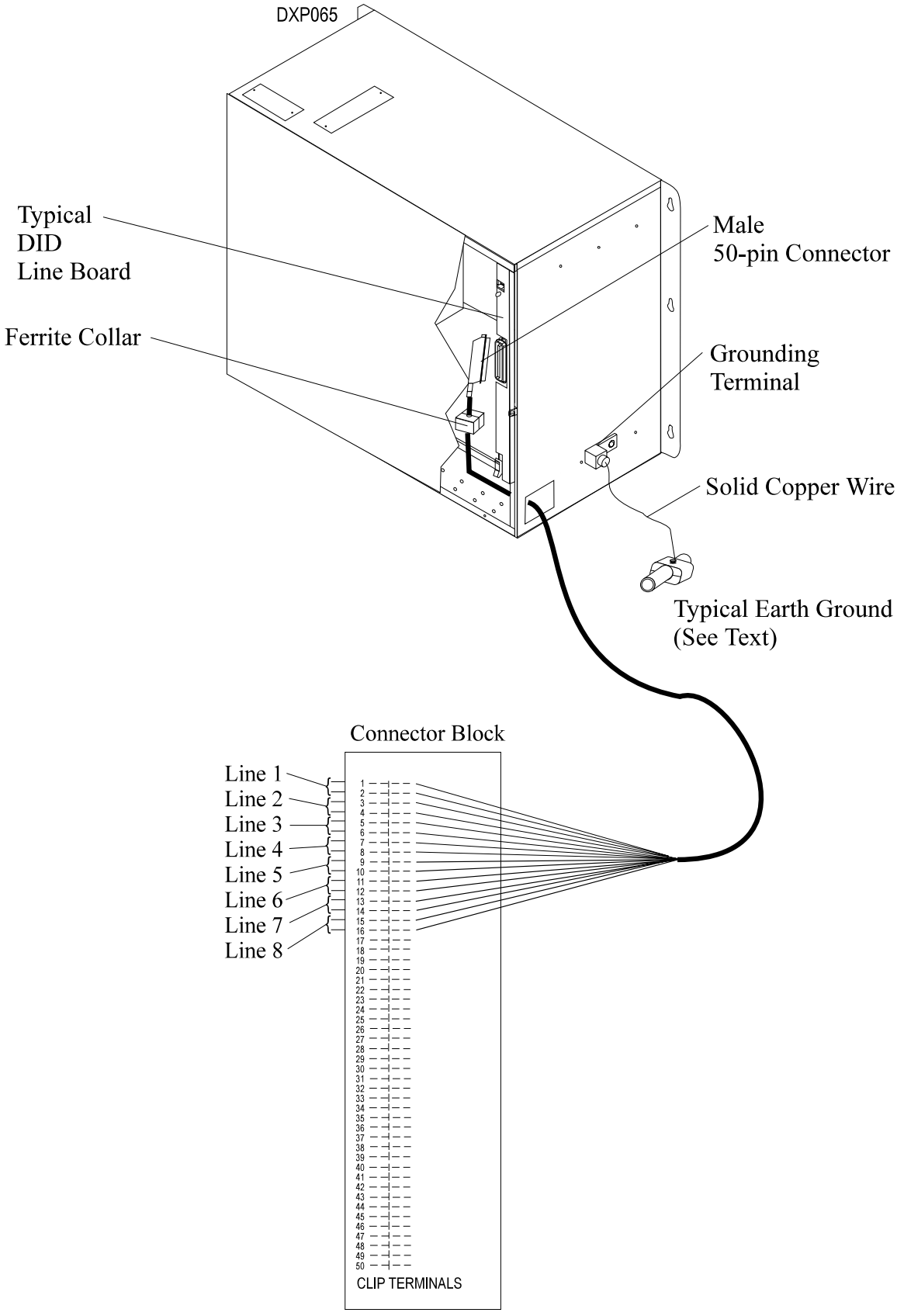
1. Replace the front panel on the common equipment cabinet.
2. Plug the AC line cord into the AC outlet, reconnect any battery back up equipment and turn on the switch on the power supply.
3. Using the data base programming procedure, program the system for DID line operation.
4. Connect a buttset or an industry-standard telephone (IST) to a line port on the DID line board.
5. Take the buttset or ISToff-hook, and listen for relay click on both wink start and delay start lines.
6. Dial a CO digit string to determine if you can make a call. Have someone answer your call to determine if you have a complete talk path. If you can complete a call, this verifies that you have programmed the system correctly.
7. Repeat step 6 as desired for other CO digit strings and repeat steps 4 through 7 at all line ports on the DID line board.
8. Connect the CO-supplied DID lines to the DID board.
9. Note the DID board's status light, and compare status with the following details:

   Rapid Flash = Malfunctioning on-board processor,

   Off with repeated 5 second blink on = Normal operation with all idle lines,

   On with repeated 5 second blink off = Normal operation with at least one busy line, (lf a line is active but the LED is showing off with repeated 5 second blink on, check the wiring for poor connections),

   Three Rapid Flashes On Followed By 2.5 seconds Off = One or more lines out of service



***NOTE**: Wiring for the 8 line board is shown. Wiring for the 4 line board uses only pairs 1 through 4.*

Viewing Typical DID Line Connections

3.1 Understanding The DXP Line Port Numbering

The line numbers on every board ascend from the bottom line jack (lines 1and 2) to the top line jack (lines 7 and 8).

The line ports for both the main and expansion cabinet ascend from the rightmost slot to the leftmost slot. This means that in the main cabinet, line ports 1–8 are in the rightmost board slot, line ports 9–17 are in the next slot to the left, line ports 18–26 are in the next slot and so forth through line ports 65–72 located in the leftmost universal slot. The main cabinet supports a total of 72 lines.

Line ports in the expansion cabinet begin at the rightmost board slots with line ports 73–80 and ascend to the left at eight line ports per slot to end at the leftmost universal slot with line ports 121–128. The expansion cabinet supports a total of 56 lines.

3.2 Understanding The DID Line Connections

25-Pair Connections			Wire-Pair Connections		Line Designations	
Wire Color	**Pair**	**Pin No.**	**Clip Term.**	**Wire Name**	**Line Number**	**CO Line Number**
White-Blue	1	26	1	Tip	1	
Blue-White		1	2	Ring		
White-Orange	2	27	3	Tip	2	
Orange-White		2	4	Ring		
White-Green	3	28	5	Tip	3	
Green-White		3	6	Ring		
White-Brown	4	29	7	Tip	4	
Brown-White		4	8	Ring		
White-Slate	5	30	9	Tip	5	
Slate-White		5	10	Ring		
Red-Blue	6	31	11	Tip	6	
Blue-Red		6	12	Ring		
Red-Orange	7	32	13	Tip	7	
Orange-Red		7	14	Ring		
Red-Green	8	33	15	Tip	8	
Green-Red		8	16	Ring		
Red-Brown	9	34	17			
Brown-Red		9	18			
Red-Slate	10	35	19			
Slate-Red		10	20			
Black-Blue	11	36	21			
Blue-Black		11	22			
Black-Orange	12	37	23			
Orange-Black		12	24			
Black-Green	13	38	25			
Green-Black		13	26			
Black-Brown	14	39	27			
Brown-Black		14	28			
Black-Slate	15	40	29			
Slate-Black		15	30			
Yellow-Blue	16	41	31			
Blue-Yellow		16	32			
Yellow-Orange	17	42	33			
Orange-Yellow		17	34			
Yellow-Green	18	43	35			
Green-Yellow		18	36			
Yellow-Brown	19	44	37			
Brown-Yellow		19	38			
Yellow-Slate	20	45	39			
Slate-Yellow		20	40			
Violet-Blue	21	46	41			
Blue-Violet		21	42			
Violet-Orange	22	47	43			
Orange-Violet		22	44			
Violet-Green	23	48	45			
Green-Violet		23	46			
Violet-Brown	24	49	47			
Brown-Violet		24	48			
Violet-Slate	25	50	49			
Slate-Violet		25	50			

NOTE: Wiring for the 8 line board is shown. Wiring for the 4 line board uses only pairs 1 through 4.

4.0 Understanding The Federal Communications Requirements Concerning DID Lines

The Federal Communications Commission (FCC) requires that you inform the central office (CO) that the DXP is configured as an MF (multipurpose) registered device if you connect it to ground start DID lines. Also, FCC rules, part 68, require customer premise equipment (CPE) to return answer supervision signalling to the CO for DID calls. Allowing the DXP to be operated in a manner that does not provide answer supervision is a violation of these rules. In compliance to this ruling, the DXP system returns DID answer supervision no later than 500 milliseconds after the incoming call is serviced. The regulations require that the system return this answer supervision whenever the following DID call conditions exist:

- call answered by the called station,
- call answered by the attendant,
- call routed to a recorded announcement that can be administered by a system user,

Exceptions to the requirement are when:

- a call is not answered,
- a busy tone is received,
- a reorder tone is received.

4.1 Understanding Installer/User Information Regarding FCC Rules And Regulations

This DXP digital communications system complies with Federal Communications Commission (FCC) Rules, Part 68. The FCC registration label on the KSU contains the FCC registration number, the ringer equivalence number, the model number, and the serial number or production date of the system.

Notification To Telephone Company

Unless a telephone operating company provides and installs the system, the telephone operating company which provides the lines must be notified before a connection is made to them. The lines (telephone numbers) involved, the FCC registration number, and the ringer equivalence number must be provided to the telephone company. The FCC registration number and the ringer equivalence number of this equipment are provided on the label attached to the common equipment. The user/installer is required to notify the telephone company when final disconnection of this equipment from the telephone company line occurs.

Compatibility With Telephone Network

When necessary, the telephone operating company provides information on the maximum number of telephones or ringers that can be connected to one line, as well as any other applicable technical information. The telephone operating company can temporarily discontinue service and make changes which could affect the operation of this equipment. They must, however, provide adequate notice, in writing, of any future equipment changes that would make the system incompatible.

Installation Requirements

Connection of the electronic key system to the telephone lines must be through a universal service order code (USOC) outlet jack supplied by the telephone operating company. If the installation site does not have the proper outlet, ask the telephone company business office to install one. The correct outlet jack for this is a type RJ21X.

Party Lines And Coin Lines

Local telephone company regulations may not permit connections to party lines and coin lines by anyone except the telephone operating company.

Troubleshooting

If a service problem occurs, first try to determine if the trouble is in the on-site system or in the telephone company equipment. Disconnect all equipment not owned by the telephone company.
If this corrects the problem, the faulty equipment must not be reconnected to the telephone line until the problem has been corrected. Any trouble that causes improper operation of the telephone network may require the telephone company to discontinue service to the trouble site after they notify the user of the reason.

Repair Authorization

FCC regulations do not permit repair of customer owned equipment by anyone except the manufacturer, their authorized agent, or others who might be authorized by the FCC. However, routine repairs can be made according to the maintenance instructions in this publication, provided that all FCC restrictions are obeyed.

Radio Frequency Interference

The electronic key system contains incidental radio frequency generating circuitry and, if not installed and used properly, may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference to radio and television reception; in which case the user is encouraged to take whatever measures may be required to correct the interference. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient the television or radio's receiving antenna, and/or relocate the KSU, the individual telephone stations, and the radio or TV with respect to each other. If necessary, the user should consult the manufacturer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the Government Printing Office, Washington D.C. 20402. Stock No. 004-000-00345-4.

This digital apparatus does not exceed the (Class A) limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pes de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de la class A) prescrites dans le Réglement sur le brouillage radioélectrique édicté par le ministére des Communications du Canada.

Ringer Equivalence Number

The REN of each line is 0.4B. The FCC requires the installer to determine the total REN for each line, and record it at the equipment.

COMDIAL®

Installing The Multipurpose Line Board In The DXP Digital Communications System

1.0 Understanding The Multipurpose Line Board

The Multipurpose line board for the DXP digital communications system provides system interface for ground start lines, loop start lines, and E&M (tie) lines. These are typically the three different line types that the central office (CO) makes available for connection to the public switched network. The multipurpose line board is fully programmable for each type of line.

1.1 Detailing The Line Types

Loop Start Lines: With this line type, the DXP bridges a resistance across the tip and ring leads to signal the CO to establish a communications link for an outgoing call. The CO detects the resulting current flow and supplies dial tone to the DXP . The CO signals an incoming call to the DXP by placing an alternating voltage (ring signal) on the tip lead for the DXP to sense. The DXP then generates ringing to the DXP station being called. When a station answers the ringing, the circuit is completed as it was for outgoing calls. Loop start lines can not provide any sure means of determining when a distant party hangs up his or her telephone. For a system that experiences moderate incoming and outgoing call volume and does not cost calls, loop start lines provide an economical choice for connecting the DXP to the central office (CO) equipment. When you use line 1 for the power-fail mode, you must program that line to be a loop-start line unless the industry-standard telephone that you use as a power-fail station is a ground-start device.

Ground Start Lines: With this line type, the DXP momentarily grounds the ring lead to signal the CO to establish a communications link for an outgoing call. When the CO detects this, it acknowledges by momentarily grounding the tip lead. The DXP responds by removing its ground connection and bridging itself across the tip and ring leads. The CO then removes its ground connection and returns dial tone to the DXP.

For an incoming call, the CO grounds the tip lead and places an alternating voltage on the ring lead for the DXP to sense. The DXP detects ring-lead ground and then causes its ring generator to generate ringing to the station being called. When a station answers the ringing, the circuit is completed as it is for outgoing calls. Because ground start lines are controlled at both ends, they are capable of release supervision that provides a sure means of determining when a distant party hangs up his or her telephone. This is very important in applications where calls are costed. Also, since the signalling protocol indicates which end requested the line, it helps prevent call collisions and glare and thus is useful in applications where there is a high volume of incoming and outgoing calls occurring on the same lines. Ground start lines are standard protocol for remote networking and are useful for connecting the DXP to private branch exchange (PBX) equipment. For ground start lines to be dependable, you must ensure that you have connected the DXP to a low resistance telephone company ground.

NOTE: The Federal Communications Commission (FCC) requires that you inform the central office that the DXP is configured as an MF (multipurpose) registered device if you connect it to ground start lines.

E&M Tie Lines: The tie line connections (also known as tie trunk access) are special circuits that allow, on a dial-up or continuous connection (hot line) basis, the DXP to communicate with remotely located equipment such as: another DXP, a PBX, or to other common carrier (OCC) equipment for long distance calls. Tie lines can be a part of a private or leased network and can be metallic, carrier current, T1, or microwave.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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1.2 Detailing E&M Signalling Methods

The multipurpose line board provides two wires for a tip and ring voice circuit and two wires (the E and M line) to provide control signalling between the systems. When a local DXP puts a request for service from the remote equipment on the M lead, the remote equipment detects this request on its E lead. As an option it can also respond by putting an alerting signal on its M lead.

NOTE: Intercom feature codes of one DXP are not available to callers from the other DXP nor can those callers access a line through the distant DXP using line group access codes.

The DXP supports two different types of E and M lines. The E and M Direct type is for direct connection between two telephone systems and is also known as a metallic connection. The E and M Carrier type is for tie lines that run through a central office (CO) interface; however, some COs also provide a metallic connection interface.

If you plan to use tone dial configured E and M lines with the multipurpose line board, you may need to install one or more DTMF receiver cards to the DXP. Typically, you will need one DTMF receiver for every six lines. In high traffic situations, you may need additional DTMF receivers. For information on DTMF receiver card installation, see IMI89–186, Installing A DTMF Receiver In The DXP Digital Communications System.

NOTE: The DTMF receiver cards that you add for this purpose are in addition to any you may add to the system to support industry-standard telephone station boards

You can program the system to respond to three different standard-protocol types of E and M signalling. They are known as: immediate signalling, wink signalling, and delayed signalling and are defined in the following paragraphs.

Immediate Signalling: With this signalling method, the called DXP answers as soon as the calling DXP initiates the call. There is no delay between calling and answering. This signalling method is usually used if the line is programmed for hot line operation or is programmed for pulse dialing.

Wink Signalling: With this signalling method, the called DXP places a momentary signal reversal (wink) on its M lead to alert the calling DXPsystem that it is ready to receive information. The calling DXP controls the status of the M lead and watches for a return signal from the called DXP on the E lead. A wink occurs when the called DXP is ready to receive dialed digits from the calling DXP. Dialing can begin only after the wink is complete. After the wink occurs, the called DXP (if it is programmed for dialing) returns dial tone to the calling DXP as an indication it is ready to receive digits. This signalling method is the preferred protocol for use between two DXP systems.

Delayed Signalling: With delay dial signalling, the called DXP immediately responds to the calling DXP by sending an off-hook signal on its M lead. It holds this off-hook condition until it is ready to receive digits and then returns its M lead to on-hook. After the signal exchange occurs, the called DXP (if it is programmed for dialing) returns dial tone to the calling DXP as an indication it is ready to receive digits. This signalling method is an alternate to wink start signalling that also provides equipment readiness signals. This method is most useful if the DXP is connected to another manufacturer's PBX with incompatible wink timing parameters.

In addition to the standard-protocol signalling, you can program the system to respond to two types of non-standard tie line signalling protocols. They are known as: hot line and intercom dialing and are defined in the following paragraphs.

Hot Line: You can program the system for hot-line operation so that as soon as a user accesses the tie line, the station or stations at the distant system that have access to the personal or group intercom assigned to the hot line will ring.

Intercom Dialing: Alternately, you can program the system for intercom dialing mode so that as soon as users access the tie line they will hear dial tone. Upon hearing dial tone, they can dial either a personal or group intercom number at the distant system.

2.0 Installing Circuit Boards In The Equipment Cabinet

CAUTION

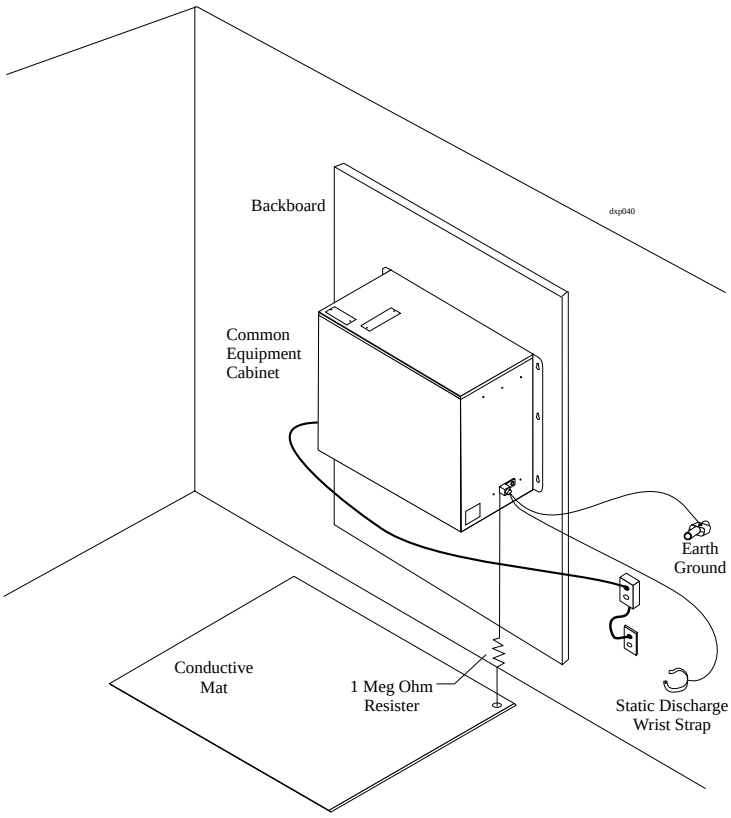
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2.1 Creating A Static Safe Work Area

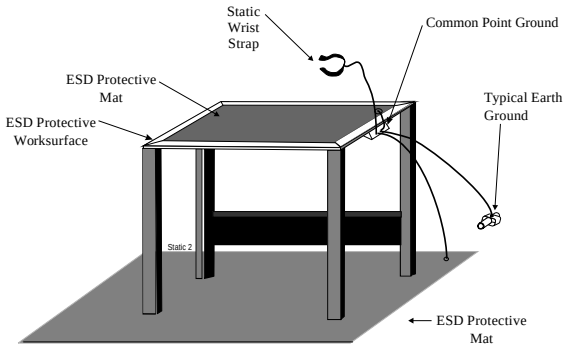
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When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

2.2 Installing Multipurpose Line Boards

1. Normally you should disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply; however, when necessary, you can install a multipurpose line board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the precharge port on the power supply. During step 6, you will connect the other end of this coil cord to the precharge jack on the line board.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground
3. Loosen the retaining hardware and lift the front panel away from the common equipment cabinet.

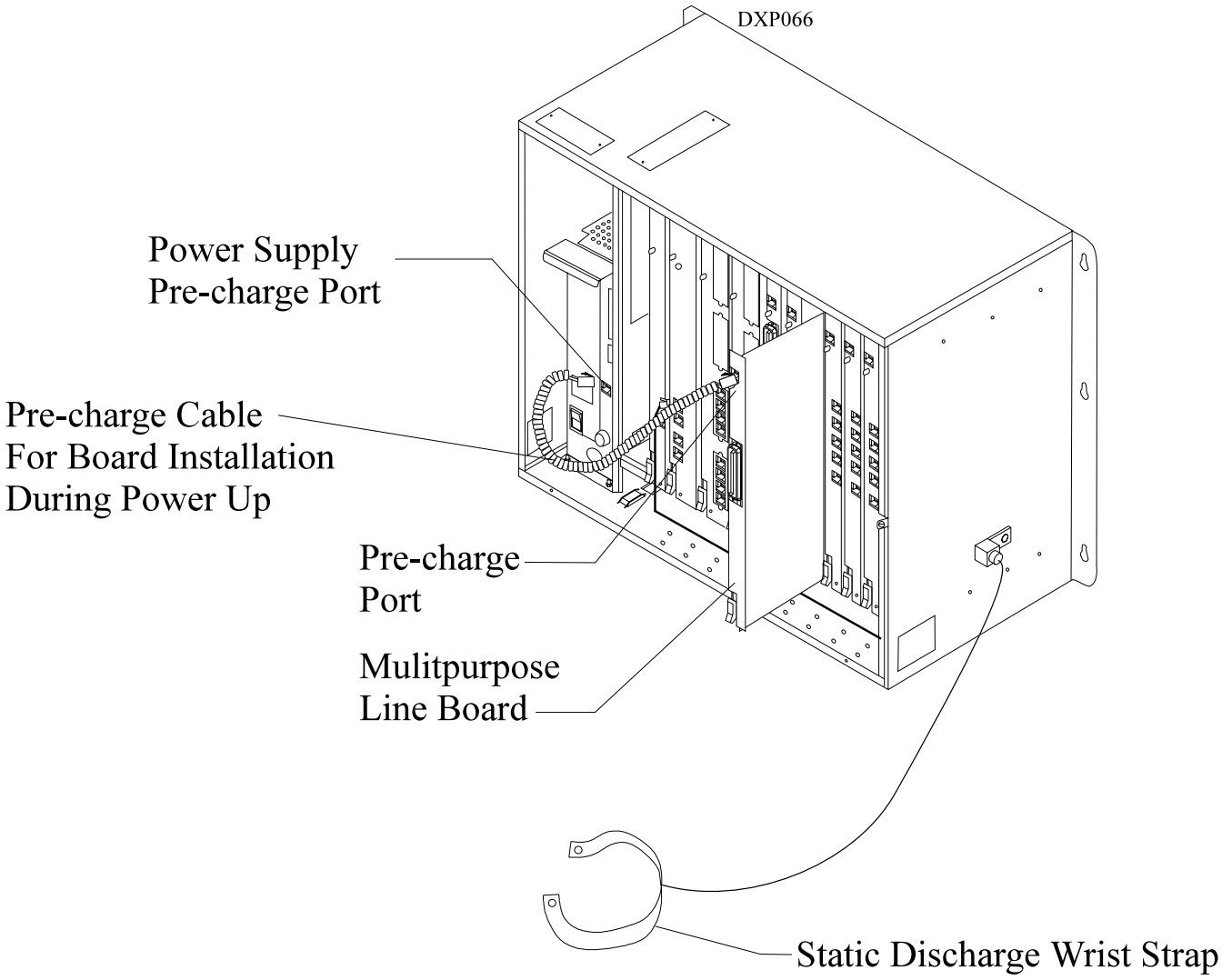
NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

4. Each multipurpose line board is supplied in a static protection bag for safe keeping. When you are ready to install the board, remove it from its static protection bag.
5. Locate the proper board slot.
   - In DXP main cabinets, line boards normally connect to line slots 1–4 and universal slots 3–5. You can connect line boards in universal slots 1 and 2; however, you occupy the only two slots that are available for auxiliary boards.
   - In DXP expansion cabinets, the line boards connect to any universal board slot.
6. If you are installing the line board in an operating system, connect the free end of the precharge cord that you installed in step 1 to the precharge jack on the line board.
7. Orient the multipurpose line board with its top and bottom guides in main cabinet board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane. If you connected handset cord between pre-charge port on DXP power supply and jack on multipurpose line board (as directed in step 6), disconnect it after installing board.

   CAUTION

   When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

8. Repeat steps 3 and 4 until all multipurpose line boards are installed.
9. Make a final inspection to ensure that all boards are, oriented correctly and mated properly.
10. Install and tighten the supplied screws to secure the circuit boards to the board cage.
    Do not neglect this step! It is important because it helps in providing a protective ground condition for the board and ensures proper functioning of E and M and ground-start lines.



Installing The Multipurpose Line Board

3.0 Connecting The Multipurpose Lines

The FCC specified jack configuration for the multipurpose board line connections to the switched network is the (USOC) RJ2EX type and the facility interface code is TL11M. This specified connection is typically a type 66M-nn connector block.

CAUTION

When connecting the lines for multipurpose applications, be sure that you do not reverse the tip and ring leads.

A 50-pin connector on the multipurpose line board provides its line terminations. You can cable connect the multipurpose board to the CO line termination with a prepared cable that matches the termination requirements. Snap the supplied ferrite collar around the cable to provide protection against radio frequency interference.

Before you connect the CO-supplied multipurpose lines to the board, program the system for proper operation.

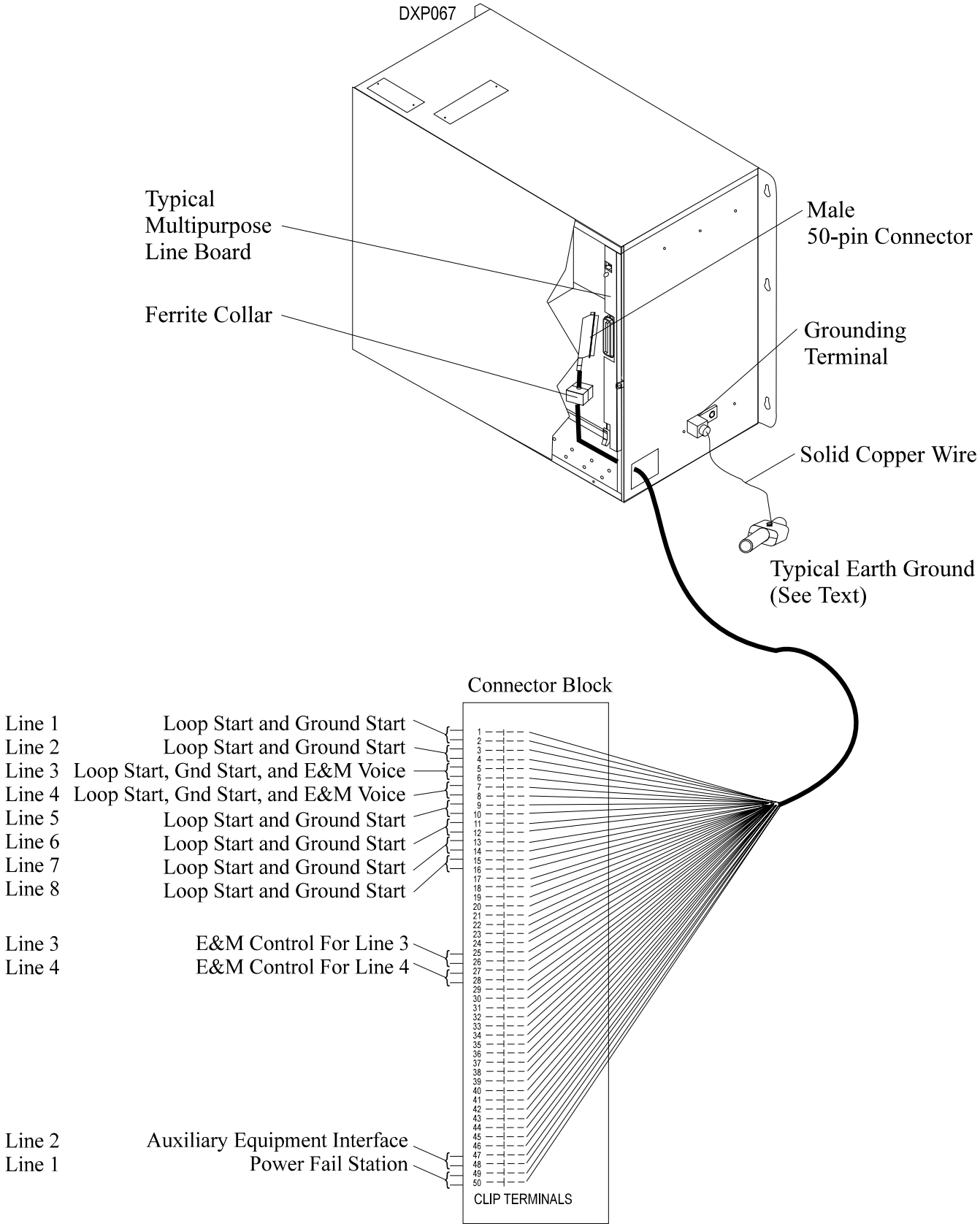
1. Replace the front panel on the common equipment cabinet.
2. Plug the AC line cord into the AC outlet, reconnect any battery back up equipment and turn on the switch on the power supply.
3. Connect the CO-supplied lines to the multipurpose board. The system will test each circuit for loop current after you connect the lines to the board. If the multipurpose line board does not detect loop current for a line (in either loop or ground start applications), it will ignore this line and show an idle condition on its status light. If this happens, you must check the line connections for proper wiring.
4. Note the multipurpose board's status light, and compare status with the following details:
   Rapid Flash = Malfunctioning on-board processor,
   Off with repeated 5 second blink on = Normal operation with all idle lines,
   On with repeated 5 second blink off = Normal operation with at least one busy line, (lf a line is active but the LED is showing off with repeated 5 second blink on, check the wiring for poor connections),
   Three Rapid Flashes On Followed By 2.5 seconds Off = One or more lines out of service

NOTE: If the system operation includes the direct inward station access (DISA) feature on a particular line, callers that use DISA to access a trunk group and place calls (trunk to trunk calling) may experience low audio levels on their calls due to the normal line resistance of CO lines. Low audio level is usually only noticeable on long line loops. If signal loss is a problem at your site, try adding a line amplifier (repeater) in the DISA line. Comdial does not recommend DISA for use on loop start lines without disconnect supervision. While DISA will function, Comdial will not be liable for its performance under any condition where disconnect supervision is not provided.

3.1 Installing E&M Lines

When you install E&M tie lines to connect the DXP to a remote telephone system, you must follow the particular wiring arrangement detailed in the following chart. From the chart, notice that line 3 of one system connects to line 4 of the other system and that the E lead of one line connects to the M lead of the other line.

Local DXP	Remote DXP
Line 3 Tip	**Line 4 Tip**
Line 3 Ring	**Line 4 Ring**
Line 3 E	**Line 4 M**
Line 3 M	**Line 4 E**
Line 4 Tip	**Line 3 Tip**
Line 4 Ring	**Line 3 Ring**
Line 4 E	**Line 3 M**
Line 4 M	**Line 3 E**


DXP067
Typical
Multipurpose
Line Board
Ferrite Collar
Male
50-pin Connector
Grounding
Terminal
Solid Copper Wire
Typical Earth Ground
(See Text)
Connector Block
Line 1 Loop Start and Ground Start
Line 2 Loop Start and Ground Start
Line 3 Loop Start, Gnd Start, and E&M Voice
Line 4 Loop Start, Gnd Start, and E&M Voice
Line 5 Loop Start and Ground Start
Line 6 Loop Start and Ground Start
Line 7 Loop Start and Ground Start
Line 8 Loop Start and Ground Start
Line 3 E&M Control For Line 3
Line 4 E&M Control For Line 4
Line 2 Auxiliary Equipment Interface
Line 1 Power Fail Station
CLIP TERMINALS

Viewing Typical Multipurpose Line Connections

3.1 Understanding The DXP Line Port Numbering

The line numbers on every board ascend from the bottom line jack (lines 1 and 2) to the top line jack (lines 7 and 8).

The line ports for both the main and expansion cabinet ascend from the rightmost slot to the leftmost slot. This means that in the main cabinet, line ports 1–8 are in the rightmost board slot, line ports 9–17 are in the next slot to the left, line ports 18–26 are in the next slot and so forth through line ports 65–72 located in the leftmost universal slot. The main cabinet supports a total of 72 lines.

Line ports in the expansion cabinet begin at the rightmost board slots with line ports 73–80 and ascend to the left at eight line ports per slot to end at the leftmost universal slot with line ports 121–128. The expansion cabinet supports a total of 56 lines.

3.2 Understanding The Multipurpose Line Connections

25-Pair Connections			Wire-Pair Connections		Line Number	Line Type
Wire Color	**Pair**	**Pin No.**	**Clip Term.**	**Wire Name**		
White-Blue	1	26	1	Tip	1	Loop Start and Ground Start
Blue-White		1	2	Ring		
White-Orange	2	27	3	Tip	2	Loop Start and Ground Start
Orange-White		2	4	Ring		
White-Green	3	28	5	Tip	3	Loop Start, Ground Start, and E&M Voice
Green-White		3	6	Ring		
White-Brown	4	29	7	Tip	4	Loop Start, Ground Start, and E&M Voice
Brown-White		4	8	Ring		
White-Slate	5	30	9	Tip	5	Loop Start and Ground Start
Slate-White		5	10	Ring		
Red-Blue	6	31	11	Tip	6	Loop Start and Ground Start
Blue-Red		6	12	Ring		
Red-Orange	7	32	13	Tip	7	Loop Start and Ground Start
Orange-Red		7	14	Ring		
Red-Green	8	33	15	Tip	8	Loop Start and Ground Start
Green-Red		8	16	Ring		
Red-Brown	9	34	17			
Brown-Red		9	18			
Red-Slate	10	35	19			
Slate-Red		10	20			
Black-Blue	11	36	21			
Blue-Black		11	22			
Black-Orange	12	37	23			
Orange-Black		12	24			
Black-Green	13	38	25	M	3	E&M Control for Line 3
Green-Black		13	26	E		
Black-Brown	14	39	27	M	4	E&M Control for Line 4
Brown-Black		14	28	E		
Black-Slate	15	40	29			
Slate-Black		15	30			
Yellow-Blue	16	41	31			
Blue-Yellow		16	32			
Yellow-Orange	17	42	33			
Orange-Yellow		17	34			
Yellow-Green	18	43	35			
Green-Yellow		18	36			
Yellow-Brown	19	44	37			
Brown-Yellow		19	38			
Yellow-Slate	20	45	39			
Slate-Yellow		20	40			
Violet-Blue	21	46	41			
Blue-Violet		21	42			
Violet-Orange	22	47	43			
Orange-Violet		22	44			
Violet-Green	23	48	45			
Green-Violet		23	46			
Violet-Brown	24	49	47	Tip	2	Auxiliary Equipment Interface (Busy Lead Detect)
Brown-Violet		24	48	Ring		
Violet-Slate	25	50	49	Tip	1	Power Fail Station
Slate-Violet		25	50	Ring		

4.0 Understanding Installer/User Information Regarding FCC Rules And Regulations

This DXP digital communications system complies with Federal Communications Commission (FCC) Rules, Part 68. The FCC registration label on the KSU contains the FCC registration number, the ringer equivalence number, the model number, and the serial number or production date of the system.

Notification To Telephone Company

Unless a telephone operating company provides and installs the system, the telephone operating company which provides the lines must be notified before a connection is made to them. The lines (telephone numbers) involved, the FCC registration number, and the ringer equivalence number must be provided to the telephone company. The FCC registration number and the ringer equivalence number of this equipment are provided on the label attached to the common equipment. The user/installer is required to notify the telephone company when final disconnection of this equipment from the telephone company line occurs.

Compatibility With Telephone Network

When necessary, the telephone operating company provides information on the maximum number of telephones or ringers that can be connected to one line, as well as any other applicable technical information. The telephone operating company can temporarily discontinue service and make changes which could affect the operation of this equipment. They must, however, provide adequate notice, in writing, of any future equipment changes that would make the system incompatible.

Installation Requirements

Connection of the electronic key system to the telephone lines must be through a universal service order code (USOC) outlet jack supplied by the telephone operating company. If the installation site does not have the proper outlet, ask the telephone company business office to install one. The correct outlet jack for this is a type RJ21X.

Party Lines And Coin Lines

Local telephone company regulations may not permit connections to party lines and coin lines by anyone except the telephone operating company.

Troubleshooting

If a service problem occurs, first try to determine if the trouble is in the on-site system or in the telephone company equipment. Disconnect all equipment not owned by the telephone company.
If this corrects the problem, the faulty equipment must not be reconnected to the telephone line until the problem has been corrected. Any trouble that causes improper operation of the telephone network may require the telephone company to discontinue service to the trouble site after they notify the user of the reason.

Repair Authorization

FCC regulations do not permit repair of customer owned equipment by anyone except the manufacturer, their authorized agent, or others who might be authorized by the FCC. However, routine repairs can be made according to the maintenance instructions in this publication, provided that all FCC restrictions are obeyed.

Radio Frequency Interference

The electronic key system contains incidental radio frequency generating circuitry and, if not installed and used properly, may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference to radio and television reception; in which case the user is encouraged to take whatever measures may be required to correct the interference. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient the television or radio's receiving antenna, and/or relocate the KSU, the individual telephone stations, and the radio or TV with respect to each other. If necessary, the user should consult the manufacturer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the Government Printing Office, Washington D.C. 20402. Stock No. 004-000-00345-4.

This digital apparatus does not exceed the (Class A) limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pes de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de la class A) prescrites dans le Réglement sur le brouillage radioélectrique édicté par le ministére des Communications du Canada.

Ringer Equivalence Number

The REN of each line is 0.4B. The FCC requires the installer to determine the total REN for each line, and record it at the equipment.

COMDIAL®

Installing The DXPT1 Digital Carrier Transmission Option In The DXP Digital Communications System

1.0 Introducing The DXPT1 Option

The digital carrier transmission option (DXPT1) gives the DXP digital communications system the capability to handle up to 24 channels of voice and/or data transmissions over a single four-wire cable using multiplexing techniques in superframe (SF) or extended superframe (ESF) format. The DXPT1 board includes a customer service unit (CSU) to eliminate the need for a CSU external to the DXP.

Each DXPT1 board handles up to 24 channels. You can install up four DXPT1 boards in the DXP system. You can install two boards at slots LINE2 and UNV5 in the main cabinet and slots UNV8 and UNV12 in the expansion cabinet. Of course, any other line boards that you install, such as loop start, DID or multipurpose, reduce the number of lines available for T1 service and may reduce the number of DXPT1 boards that you can install.

Whenever you install one or more DXPT1 boards, and the DXP is receiving its timing signals from an external source, you must install one synchronization card (DXOPT–SYN) on the services board. When you connect the system to central office (CO) lines, you must include a synchronization card, and the DXP must be controlled by CO signalling. In installations where the DXP supplies the clock signal for the distant system, there is no requirement for DXOPT–SYN cards.

If you plan to use tone dial configured DID or E&M lines with the T1 digital carrier transmission option, you will need to install one or more DTMF receiver cards in the DXP. Typically, you will need one DTMF receiver for every six lines. This ratio indicates that you need to add one DTMF receiver card for each DXPT1 board that is configured for 24 DID or E&M lines. In high traffic situations, you may need additional DTMF receiver cards.

NOTE: The DTMF receiver cards that you add for this purpose are in addition to any you may add to the system to support industry-standard telephone station boards

If you are unfamiliar with the terms and component names associated with the T1 digital carrier transmission option, refer to glossary of terms presented in *Section 8* located at the end of this publication.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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1.1 Understanding The DXPT1 Board

Through time division multiplexing, the DXPT1 board greatly increases the efficiency and economy of the DXP system by providing up to 24 channels on two twisted metallic pairs. This multiplexing technique allows two-way voice or data communications at 1.544 Mbps (million bits per second) with either a central office (CO), public branch exchange (PBX), or another digital communications system (DXP). The DXPT1 board includes a built-in customer service unit (CSU) but there is no restriction on adding an external CSU.

When you connect two DXP systems together using E&M protocol through the T1 lines, designate one DXP as the master and the other one as the slave. In this application, only the slave DXP system requires a DXOPT–SYN card.

When the T1 option is installed, the DXP supports the following signaling protocols per channel.

- Loop Start (subscriber end only)
- Ground Start (subscriber end only)
- E&M two- or four-wire tie lines
- DID (direct inward dial)

Loop Start and Ground Start will support synchronized ring, hook flash, and pause. Dialing can be DTMF (tone) or dial pulse. For E&M and DID tone operation, check the number of DTMF receiver cards needed in the system

E&M and DID will support wink start, delay dial, and immediate dial (dial pulse only). Dialing can be tone or dial pulse.

1.2 Understanding The DXOPT-SYN Synchronization Card

The DXOPT–SYN card uses a reference timing frequency of 8 KHz that it derives from the 1.544 MHz frequency supplied to the DXPT1 board by the central office (CO) or other external source. By referencing this 8 KHz with 8 KHz timing derived internally, the master 16.384 MHz voltage-controlled oscillator (VCO) can be synchronized. The T1 transmit clock (1.544 MHz) is derived from the 16.384 MHz frequency on the DXPT1 board. If the 1.544 MHz received frequency is incorrect (not within a 200 Hz tolerance), the system may loose synchronization with the CO or other external source. The DXOPT–SYN card reports this condition by turning on the appropriate alarms on the DXPT1 board and DXOPT–SYN card. A loss of clock synchronization causes frame slips that result in data communications errors.

The DXOPT–SYN card allows two timing references (primary and secondary) to be selected. You can select either automatic or manual (for maintenance mode). In the automatic mode, a loss of primary timing causes the system to switch to the secondary timing reference. If both the primary and secondary timing references are lost, the VCO oscillator on the DXOPT–SYN card is defaulted to the fixed 16.384 MHz oscillator on the services board. This results in the loss of T1 clock synchronization.

2.0 Installing Circuit Boards In The Equipment Cabinet

CAUTION

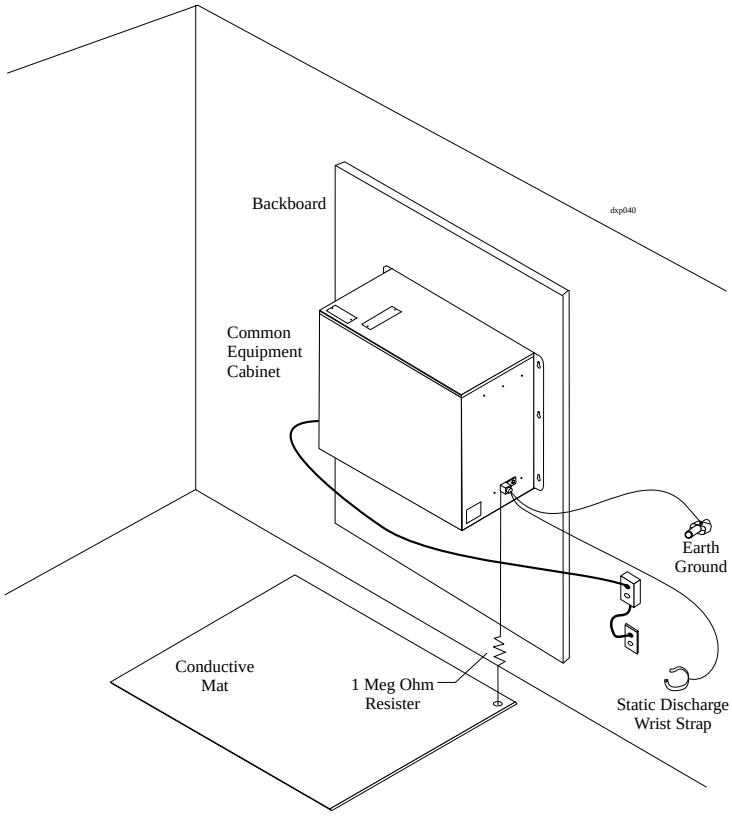
Circuit boards are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, *for general information. Specific handling precautions are also included in this installation instruction.*

2.1 Creating A Static Safe Work Area

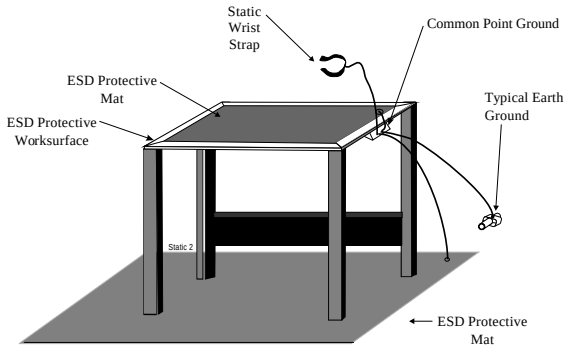
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

3.0 Configuring The DXPT1 Board

Before you install the DXPT1 board, determine if you must meet special system requirements such as fractional service (8 or 16 channel operation). If you do have special system requirements, use the dual in-line pin (DIP) switches provided on the board to re-configure the DXPT1 board.

The DXPT1 board contains 28 DIP switches (three 8-position modules and one 4-position module). Rectangular cutouts in the front-edge panel provide access to these switches.

The eight DIP switches nearest the bottom of the panel are accompanied by eight green LED indicators.

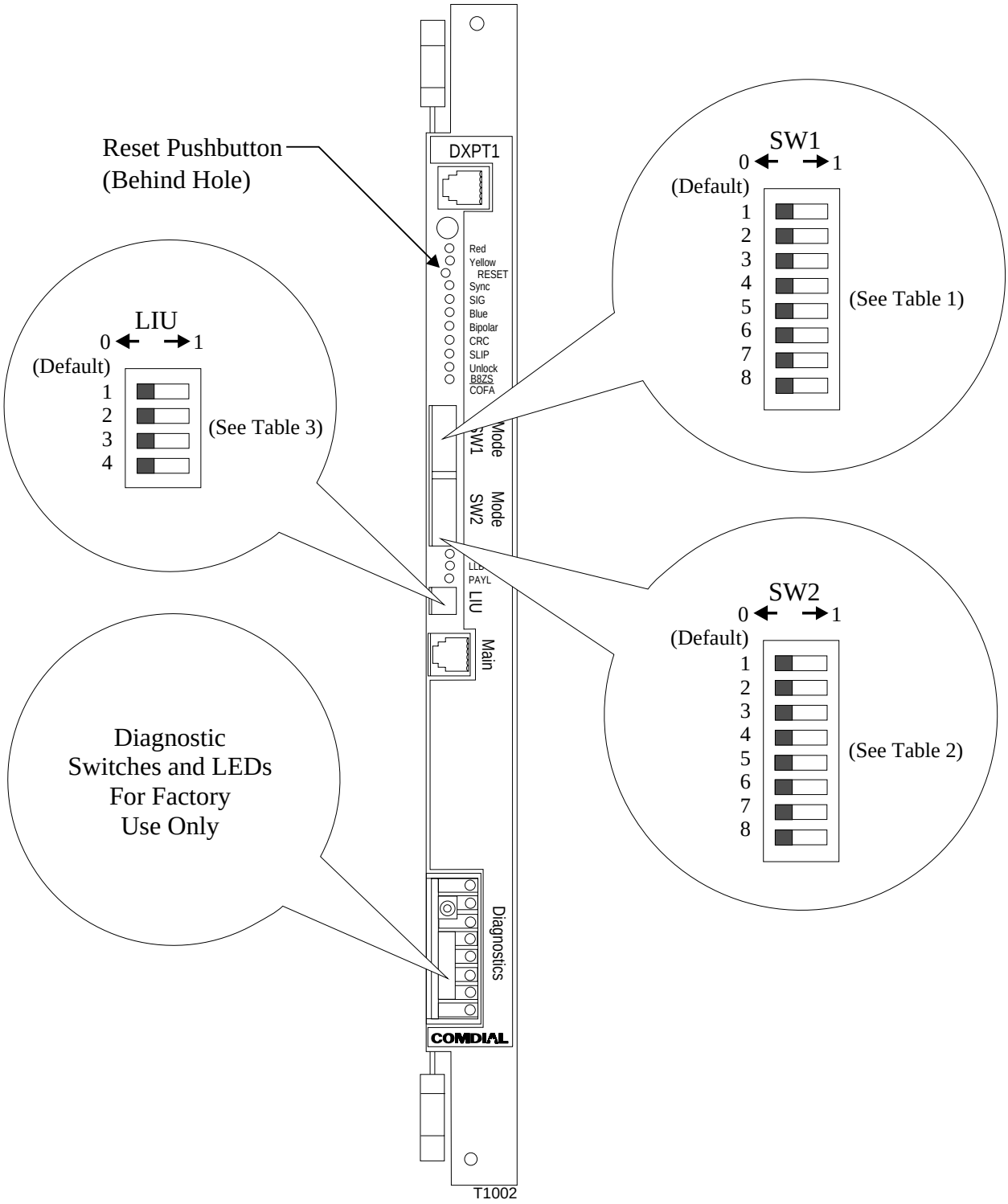
NOTE: These eight switches and their associated indicators are for factory diagnostic purposes only.

The remaining 20 DIP switches labeled SW1, SW2. and LIU are for configuring the DXPT1 board to meet specific operating requirements.. The default setting for all of these switches is 0 (on the left as you face the front edge of the board). This is the standard superframe (SF) configuration for most customer applications. However, special customer needs may require that you reset one or more of these switches using the procedure given below.

1. Obtain a static discharge wrist strap (supplied with the main DXP cabinet) and attach it to one of your wrists. Make sure to adjust the strap for a snug fit against your skin; do not apply the strap over any of your clothing.
2. Connect one end of the wrist strap-cord to the wrist strap and the other end to earth ground.

NOTE: With the DXP cabinet in the installed position, the ground lug on the right side of the cabinet is normally a good grounding point since this lug should have a heavy ground wire connected between it and a good earth ground.

3. Remove the DXPT1 board from its static protection bag and set it on a static-safe work area.
4. Using a ball-point pen or similar object, move the DIP switches from left (0 position) to right (1 position) as needed. All DIP switches are facing left for typical applications. See Tables 1, 2, and 3 for descriptions of the DIP switches.



Locating The DIP Switches

3.1 Understanding The T1 Options (SW1–1 Through SW1–8)

The following T1 operating modes are described to help you understand the many options that you can select with DIP switches SW1–1 through SW1–8 on the DXPT1 board.

3.1.1 T1 General Operation

T1 is the digital two-way transmission of telecommunications over a single high-speed circuit. Up to 24 separate voice or data transmissions form digital pulses that are transferred at the rate of 1.544 million bits per second (Mb/s) over the T1 trunk. At the receiving end, the digital pulses are decoded into 24 separate circuits.

Pulse characteristics such as repetition rate, pulse width, pulse amplitude, and average ones density ((ratio of one (1) bits to zero (0) bits)) are as specified by digital signal level 1 (DS-1) described in American National Standards Institute Specification, ANSI T1.403-1989.

3.1.2 Framing Modes

Digital data is handled most efficiently when it is organized into frames. A frame of digital information consists of 193 bits (24 channels x one eight-bit word + one framing or control bit). The framing bit is used for frame identification when multiple frames are used.

The frame repetition rate is eight thousand frames per second (8 Kf/s).

This option uses either of two framing formats—superframe (SF) and extended superframe (ESF).

The superframe format contains 12 frames. In the 6th and 12th frames, the voice information in the eighth (least significant) bit positions is overwritten with signaling information. This signaling method is called robbed-bit signaling. The robbed bits in the 6th and 12th frames are designated signaling bit A and B respectively.

The extended superframe format extends the framing boundaries to include 24 frames . The ESF format provides improved maintenance capability over the SF format. In this format, 24 framing bits (or 8 Kb/s) are available to provide the following:

- framing synchronization (2 Kb/s)
- facility data link (FDL) (4 Kb/s)
- CRC-6 error check (2 Kb/s)

The robbed bits from the 6th, 12th, 18th, and 24th frames are used for signaling. Therefore, two additional signaling paths are available—signaling bits C and D (future).

3.1.3 Signaling Type

Channel associated signaling (CAS) is a signaling method employing robbed bits. The signals using the robbed bits are related to the same channel as the one carrying the information. CAS is currently the only signaling-type option available for this equipment.

3.1.4 Yellow Alarm

A yellow alarm is a signal transmitted by a digital communications system when that system has lost synchronization to the incoming signal. Communications can be restored if a a yellow alarm lasts less than four seconds. After four seconds, a red alarm (out-of-service) is issued and all calls are set to on-hook. When the system is using the superframe format, the transmitted yellow alarm signal contains binary zeros (0s) in the second bit positions of all 24 channels. This is the default setting for DIP switch SW1–4.

The 12th frame method (used in Japan) forces the framing bit for the 12th channel to a binary one (1). This is detected by the receiving system as a yellow alarm.

In the extended superframe format, the system that has lost synchronization to the incoming signal will transmit a 16-bit pattern consisting of eight one (1) bits followed by eight zero (0) bits over the facility data link (FDL) to represent a yellow alarm.

3.1.5 Zero Suppression

There are two ways to avoid system timing problems when eight or more successive zero (0) bits are transmitted. One method is B7 suppression and the other is bipolar 8-zero substitution (B8ZS). For pulse modulated voice (PCM), eight consecutive zero (0) bits should never occur.

B7 suppression is a technique that forces a one (1) bit in the 7th bit position when all of the bits in a binary word are zero (0). The resulting distortion in a voice circuit is negligible. However, this technique could induce errors if it was used in digital data transmissions.

Digital information transmitted over T1 trunks is bipolar; that is, the binary ones (1s) pulses (marks) alternate between a positive and a negative voltage level. The bipolar 8-zero substitution (B8ZS) method substitutes four bits in bit positions four, five, seven, and eight when eight zero (0) bits occur in a binary word. The substituted bits are inserted in a unique pattern that causes a bipolar error. The B8ZS binary words containing the deliberate bipolar errors are detected at the receiving terminal where the errant bipolar pulses are removed and substituted with all zero (0) bits. Because the received binary words are returned to their original bit patterns (all binary zero bits), a clear channel is provided for error-free digital data transmission. Both ends of the communications link must be configured to use B8ZS. (B8ZS is a feature designed for future requirements.)

3.1.6 Fractional T1

Fractional T1 is when you use only a portion of a T1 trunk, as needed. On the DXP you must set DIP switches SW1–7 and SW1–8 for 24 channel operation. This setting allows the system to pass error information end-to-end when operating fractional T1 with the ESF format.

Setting The SW1 DIP Switches

Switch Number	Switch Position	Function
1 (top)	0 (default) 1	FRAME MODE superframe mode (SF) extended superframe mode (ESF)
2	0 (default) 1	SIGNALING TYPE channel associated signaling (CAS) reserved
3	0 (default) 1	RESERVED FOR FUTURE USE reserved reserved
4	0 (default) 1	YELLOW ALARM TYPE bit 2 of all channels method 12 frame method (Japanese)
5,6	0, 0 (default) 0,1 1,0 1,1	ZERO SUPPRESSION B7 suppression B8ZS suppression (digital data) no suppression no suppression
7,8	0,0 default) 0,1 1,0 1,1	CHANNEL CAPACITY 24 channel capacity 8 channel capacity (fractional) 16 channel capacity (fractional) reserved

NOTE: SW1–1 through SW1–8 switches are read only when you apply power to the board or do a manual reset. With power on, manually reset the board by inserting a slender object, such as a straightened-out paper clip, into the small hole located between the Yellow and Syn LEDs on the front-edge panel. You can also reset the board remotely from a video display terminal or personal computer. A reset causes a T1 service disruption.

3.2 Understanding The T1 Options (SW2–1 Through SW2–8 And LIU–1 Through LIU–4)

The following T1 operating modes are described to help you understand the many options that you can select with DIP switches SW2–1 through SW2–8 and LIU–1 through LIU–4 on the DXPT1 board. DIP switches designated LIU are associated with the DXPT1 board's line interface unit.

3.2.1 Loopback

Loopback is the maintenance routine used to verify the receive function (local or remote) and to isolate system problems. When using the superframe format, the customer interface (CI) loopback option from the network, if provided, can be activated from the network via in-band signaling (per ANSI T1.403, 1989, SECTION 8.3.1.1). Framed code words activate and deactivate loopback routines when the option is enabled with DIP switch SW2–1. The default setting is off, but many central offices will support SF loopback. **See your central office representative to ensure that you are complying with their requirements.**

You access remote and payload loopback operation via the facility data link when using the extended superframe format.

You can manually make three different types of loopback requests depending on the option you select using DIP switches SW2–7 and SW2–8. These are: local, remote, and payload loopback. When using payload loopback (ESF format only), all channel bits maintain bit-sequence integrity but the framing bit is re-established.

3.2.2 Customer Service Unit (CSU) Identification Bit

You can set the message-oriented (C/R) bit transmitted over the ESF data link by DIP switch SW2-2 to be a zero (0) bit or a one (1) bit. The C/R bit is used to identify the T1 signal origin as being either from customer premise equipment (CPE) or carrier equipment such as a CSU.

Set C/R to be a zero (0) bit for customer premise equipment (CPE) or when using an external CSU (default).

Set C/R to be a one (1) bit if the network requires the T1 internal CSU to be classified as carrier equipment.

3.2.3 Cyclic Redundancy Check (CRC-6)

This is a method for checking the accuracy of data transmissions when using the ESF format. This method uses a polynomial algorithm based on the content of a superframe of data. When CRC-6 checking is enabled via DIP switch SW2–4, an alarm will be activated whenever a CRC code (checksum) is received over the ESF data link that does not match the locally calculated code (checksum).

3.2.4 Yellow Alarm During ANSI Messages On The Facility Data Link

When using the ESF format, the facility data link is available for reporting transmission performance information once a second. Normally, these transmissions are inhibited by yellow alarms. However, you can set DIP switch SW2-5 to allow these transmissions during yellow alarms.

3.2.5 Green B8ZS/COFA LED Definition

The green LED on the DXPT1 board's edge-panel labeled "B8ZS/COFA" indicates either that B8ZS code words are being received or that a change of frame alignment (COFA) occurred during the last synchronization by the external T1 source or carrier equipment. You can determine which condition you want reported by how you set DIP switch SW2–6. The default setting is for "COFA" reporting.

3.2.6 Receive Sensitivity

The equalizer gain logic (EGL) determines how sensitive the receive circuits are to the incoming signals. You set the level for -26 dB or -36 dB by using DIP switch LIU-1. (Normally, the -26 dB level setting is the better choice.)

3.2.7 Transmit Level Attenuation

You can manually set the transmit level for a particular value (0, -7.5, -15, or -22.5 dB) or select the automatic feature that sets the transmit level automatically depending on the receive signal. A weak receive signal causes a strong transmit signal and vice versa. Use DIP switch LIU–2 to select either the manual or the automatic setting. If you select the manual setting, set the desired value with DIP switches LIU–3 and LIU–4. Normally, 0 dB is used when connecting to a network interface box.

Setting The SW2 DIP Switches

Switch Number	Switch Position	Function
1 (top)	**0 (default)** **1**	**superframe NETWORK IN-BAND loopback** **disabled** **enabled**
2	**0 (default)** **1**	**CSU ID (C/R) BIT (ESF MODE)** **C/R bit = 0 designates customer premise equipment (CPE)** **C/R bit = 1 designates carrier equipment**
3	**0 (default)** **1**	**RESERVED FOR FUTURE USE** **reserved** **reserved**
4	**0 (default)** **1**	**CRC (CYCLIC REDUNDANCY CHECK) FOR ESF MODE** **disabled** **enabled**
5	**0 (default)** **1**	**FDL YELLOW ALARM DURING ANSI MESSAGES** **disabled** **enabled**
6	**0 (default)** **1**	**B8ZS/COFA LED DEFINITION** **COFA (change of frame alignment)** **B8ZS detect**
7,8	**0,0 (default)** **0,1** **1,0** **1,1**	**MANUAL loopback REQUEST** **no loopback** **local loopback request** **remote loopback request** **payload loopback request (ESF only)**

NOTE: When changing DIP switch SW2–2 or SW2–5, you must reset the board before the switch is read. With power on, manually reset the board by inserting a slender object, such as a straightened-out paper clip, into the small hole located between the Yellow and Syn LEDs on the front-edge panel. You can also reset the board remotely from a video display terminal or personal computer. A reset causes a T1 service disruption.

Setting The LIU DIP Switches

Switch Number	Switch Position	Function
1 (top)	**0 (default)** **1**	**RECEIVE SIGNAL SENSITIVITY** **-26 dB** **-36 dB**
2	**0 (default)** **1**	**TRANSMIT LEVEL MODE** **Automatic (level set by receive signal)** **Manual (level set by switches 3 and 4 below)**
3,4	**0,0 (default)** **0,1** **1,0** **1,1**	**TRANSMIT LEVEL ATTENUATION** **(LIU-2 must be "1")** **0 dB** **-7.5 dB** **-15 dB** **-22.5 dB**

4.0 Installing The DXPT1 Board

1. Normally you should disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply; however, when necessary, you can install a DID line board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the precharge port on the power supply. During step 6, you will connect the other end of this coil cord to the precharge jack on the line board.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground
3. Loosen the retaining hardware and lift the front panel away from the common equipment cabinet.

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

4. Each DXPT1 line board is supplied in a static protection bag for safe keeping. When you are ready to install the board, remove it from its static protection bag.
5. Locate the slot where you will install the DXPT1 board.
   You can install the DXPT1 board in either the UNV5 or the LINE2 slot in the main cabinet. If the system includes an expansion cabinet, install the board in either the UNV8 or UNV12 slot of the expansion cabinet. Depending on the board's configuration—8, 16, or 24 channel, and whether it is in a universal slot or a trunk slot, certain constraints apply as detailed in the following chart.

Configuration Constraints

Channels	Slot	Constraints
24	**Universal**	**No trunk board in left two slots. No station board in left one slot.**
24	**Line**	**No trunk board on either side**
16	**Universal**	**No trunk board in left one slot**
16	**Line**	**No trunk board in right one slot**
8	**Universal**	**No constraints**
8	**Line**	**No constraints**

CAUTION

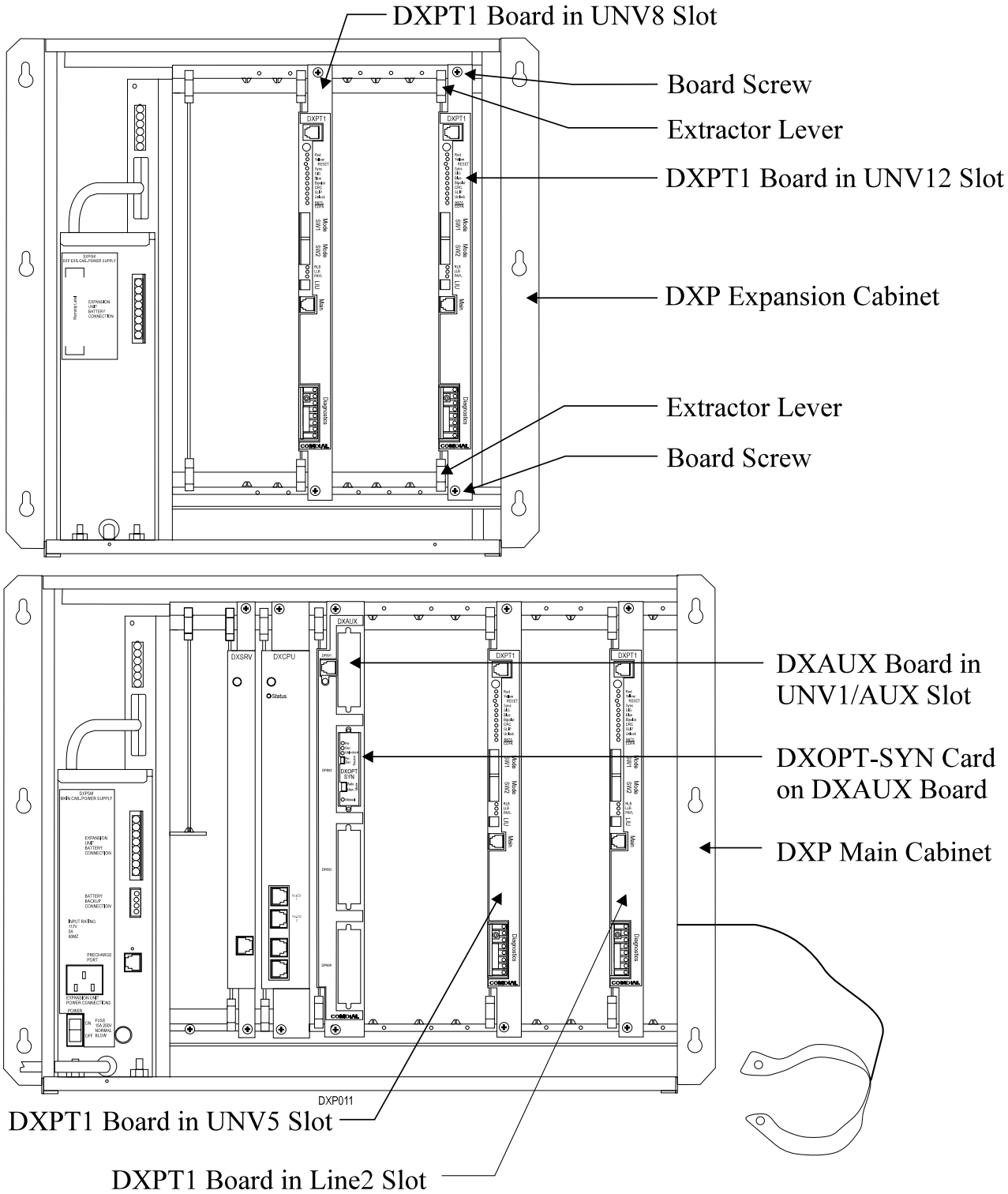
If you violate the configuration constraints, the last board installed will not function and the status indicator will be turned on.

6. If you are installing the DXPT1 line board in an operating system, connect the free end of the precharge cord that you installed in step 1 to the precharge jack on the line board.
7. Orient the DXPT1 line board with its top and bottom guides in main cabinet board cage, and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane. If you connected a handset cord between the pre-charge port on DXP power supply and *the jack on DXPT1 line board (as directed in step 6), disconnect it after installing board.*

CAUTION

When pressing circuit boards into place, press them only at the extractor lever locations.
If you apply pressure at other locations you may damage the board assembly.

8. Repeat steps 3 and 4 until all DXPT1 line boards are installed.
9. Make a final inspection to ensure that all boards are, oriented correctly and mated properly.
10. Install and tighten the supplied screws to secure the circuit boards to the board cage. ***Do not neglect this step! It is important because it helps in providing a protective ground condition for the board thus ensuring RFI (radio frequency interference) and lightning protection.***



Installing The DXPT1 Board

4.1 Connecting The T1 Trunk

Terminate the end of the T1 trunk with a miniature 8-pin modular plug, and plug it into the main jack on the front edge of the DXPT1 board.

The DXPT1 board contains a built-in CSU that protects the DXP from voltage surges, provides transmission drive up to 6,000 feet, and performs diagnostic tests for the network. Therefore, a customer-supplied CSU is not necessary unless your customer requires this addition.

If a direct connection to a repeater is within a few hundred feet, the transmit signal from the DXPT1 board may overdrive the repeater. Repeaters normally operate best with -7.5 to -23 dB input signals. Arrange LIU switches 2, 3, and 4 to set the transmit signal level (0 dB is default).

IMPORTANT CAUTION

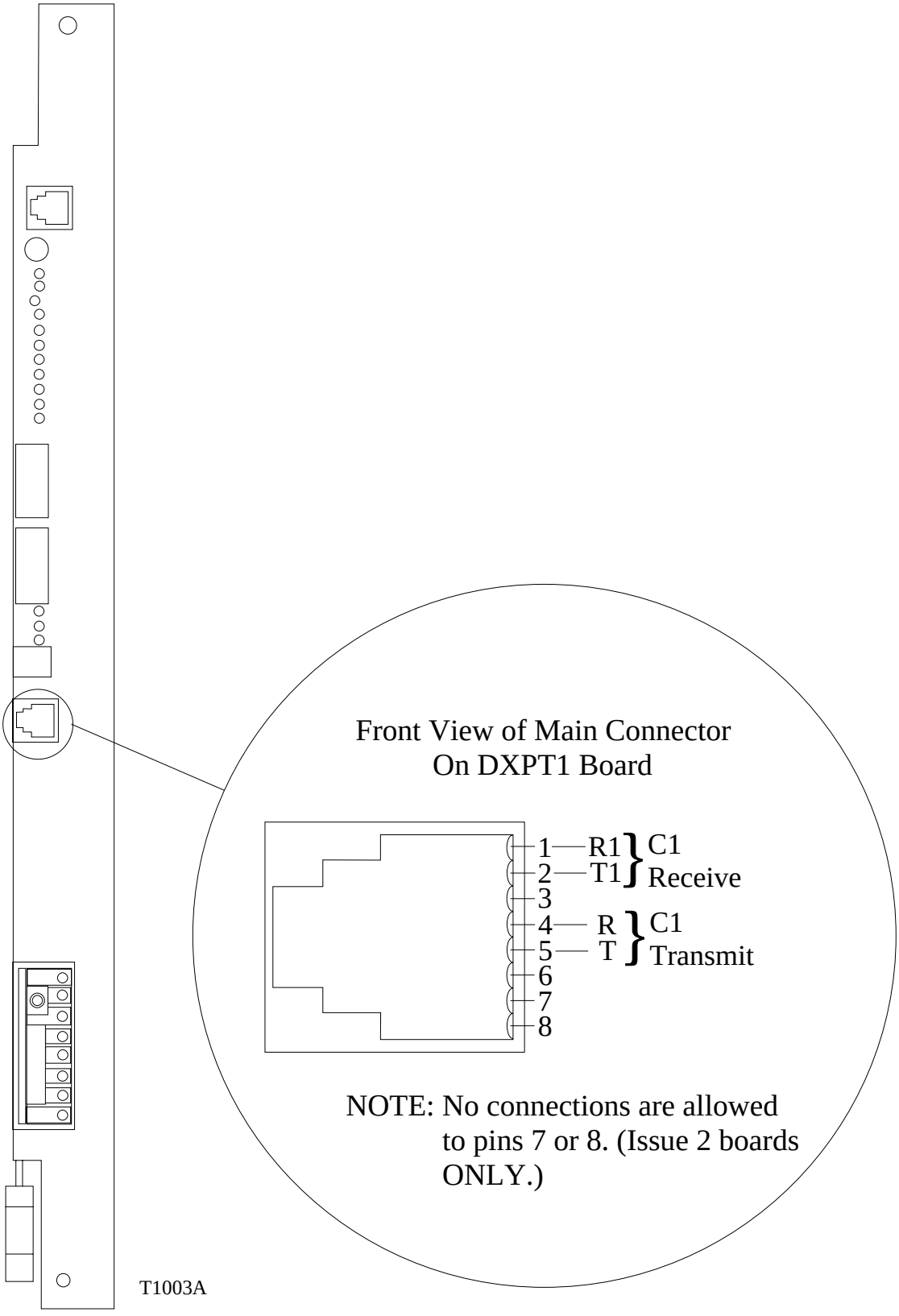
To help ensure that external over-voltage surges do not damage the system, Comdial engineers suggest that you install a properly-grounded gas discharge tube or a similar primary protection device on the T1 trunk where it enters the building. If the site includes a network interface box, verify that there is standard lightning protection installed externally to the box on its network side. Primary protection where the cable enters the building is necessary to prevent a fire hazard inside the building.

4.2 Detailing The T1 Cable Requirements

Normally, the DXPT1 board connection to a central office is via a network interface box (smart jack). The box is usually small with an 8-pin modular telephone jack for connecting to the customer premise T1 equipment (DXPT1). For short lengths of approximately 200 feet or less, use a standard telephone cable with an 8-pin modular plug for connection to the DXPT1. Make straight-through connections for pins 1, 2, 4, and 5 when using these plugs on both ends of the cable. (Do not connect Pins 7 and 8.)

When spanning distances greater than 200 feet, use a low-capacitance cable (data-grade cable) having two twisted, solid-conductor wire pairs with shielding. The type of cable with metal shielding covering each twisted pair provides the best immunity from electrical interference. Only connect the shielding to earth ground at one end of the cable—do not ground the shielding at the other end of the cable.

NOTE: When connecting the local DXP directly to another DXP system, be sure to connect the transmit pair (pins 4 and 5) of the local system to the receive pair (pins 1 and 2) of the distant system. Likewise, connect the receive pair (pins 1 and 2) of the local system to the transmit pair (pins 4 and 5) of the distant system.



Connecting The TI Trunk To The DXPT1 Circuit Board

5.0 Installing The Syncronization Card And The Auxiliary Board

5.1 Attaching The Synchronization Card To The Auxiliary Board

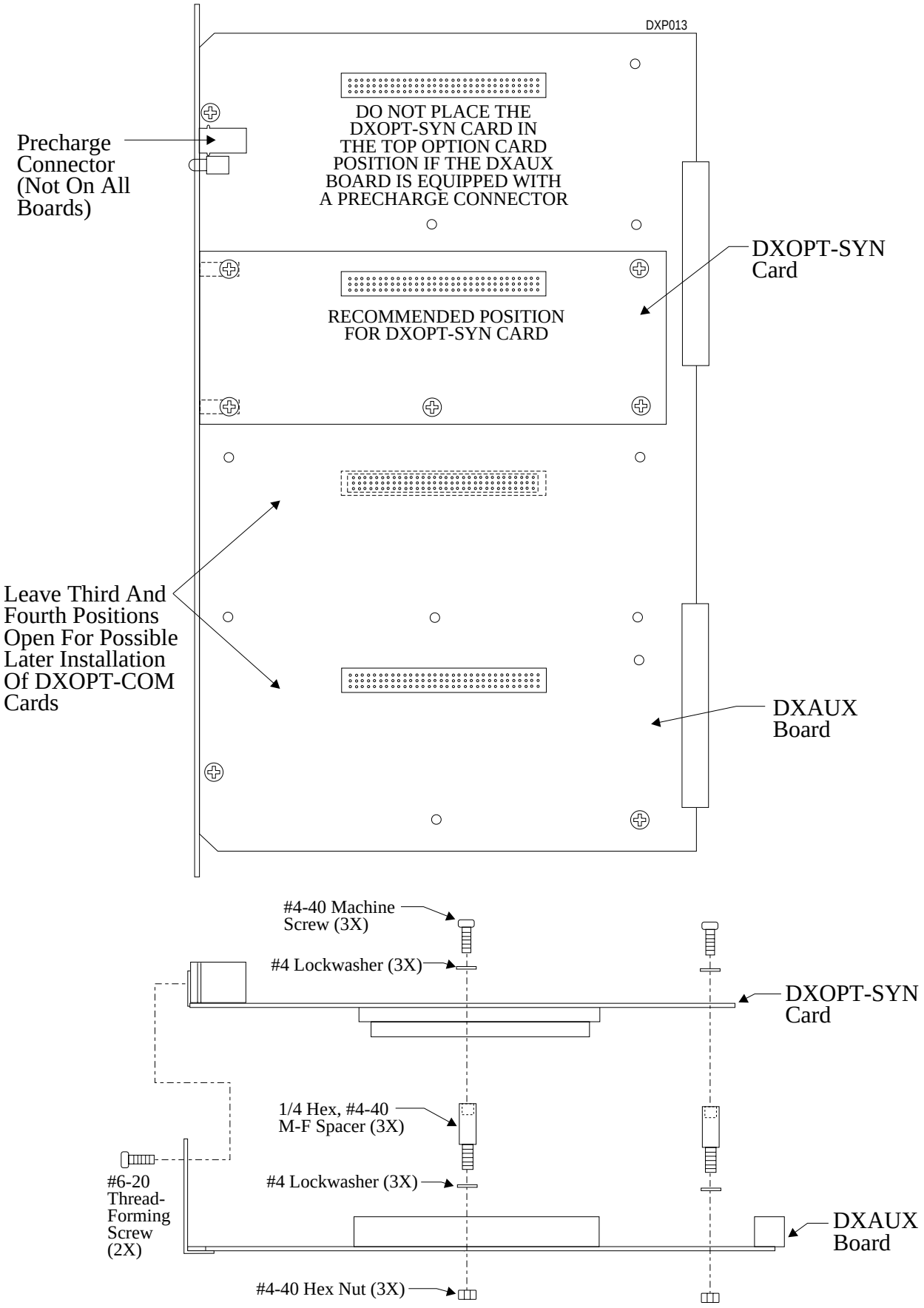
Whenever you install one or more DXPT1 boards, and the DXP is receiving its timing signals from an external source, you must install one synchronization card (DXOPT–SYN) on the auxiliary board using the following procedure.

NOTE: Whenever you install one or more DXPT1 boards, and the DXP is receiving its timing signals from an external source, you must install one synchronization card (DXOPT–SYN) on the auxiliary board. When you connect the system to central office (CO) lines, you must include a synchronization card, and the DXP must be controlled by CO signalling. In installations where the DXP supplies the clock signal for the distant system, there is no requirement for DXOPT–SYN cards and you do not need to perform this procedure.

1. Switch off the DXP power supply, disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground
3. Loosen the retaining hardware and lift the front panel away from the common equipment cabinet.

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

4. Locate the auxiliary board (if installed at either the UNV1/AUX or UNV2/AUX slots), loosen the retaining screws, remove it from the main cabinet, place it in a static protection bag, and transport it to the static-safe work area.
5. At the static-safe work area, with your wrist strap in place, remove the auxiliary board and the DXOPT–SYN card from their static protection bags.
6. Refer to the illustration, and install the DXOPT–SYN card at the second position on the auxiliary board with the supplied hardware. Avoid the top position because of possible physical interference, and reserve the lower two positions on the auxiliary board for communication cad installation.
7. Use the method detailed in Section 5.1 to set the strapping switches on the services board. If you wish, refer to step 8 for details, and transport the board assembly to the cabinet installation site before you set the strapping switches.
8. Place the auxiliary board with the newly installed DXOPT–SYN card into a static protection bag and transport the assembly back to the main cabinet.


DXP013
DO NOT PLACE THE DXOPT-SYN CARD IN THE TOP OPTION CARD POSITION IF THE DXAUX BOARD IS EQUIPPED WITH A PRECHARGE CONNECTOR
Precharge Connector (Not On All Boards)
DXOPT-SYN Card
RECOMMENDED POSITION FOR DXOPT-SYN CARD
Leave Third And Fourth Positions Open For Possible Later Installation Of DXOPT-COM Cards
DXAUX Board
#4-40 Machine Screw (3X)
#4 Lockwasher (3X)
DXOPT-SYN Card
1/4 Hex, #4-40 M-F Spacer (3X)
#6-20 Thread-Forming Screw (2X)
#4 Lockwasher (3X)
DXAUX Board
#4-40 Hex Nut (3X)

Installing The Synchronization Card On The Auxiliary Board

5.2 Installing The Auxiliary Board And Synchronization Card In the DXP

1. Switch off the DXP power supply, disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground1.
3. Remove the auxiliary board with its installed DXOPT-SYN board from the static bag.
4. On the auxiliary board, set the jumper on the pair of J10 (primary) pins corresponding to the DXP cabinet slot where you installed the DXPT1 board. Do not jumper more than one pair of J10 pins. This designates the primary clock source for the DXOPT-SYN card

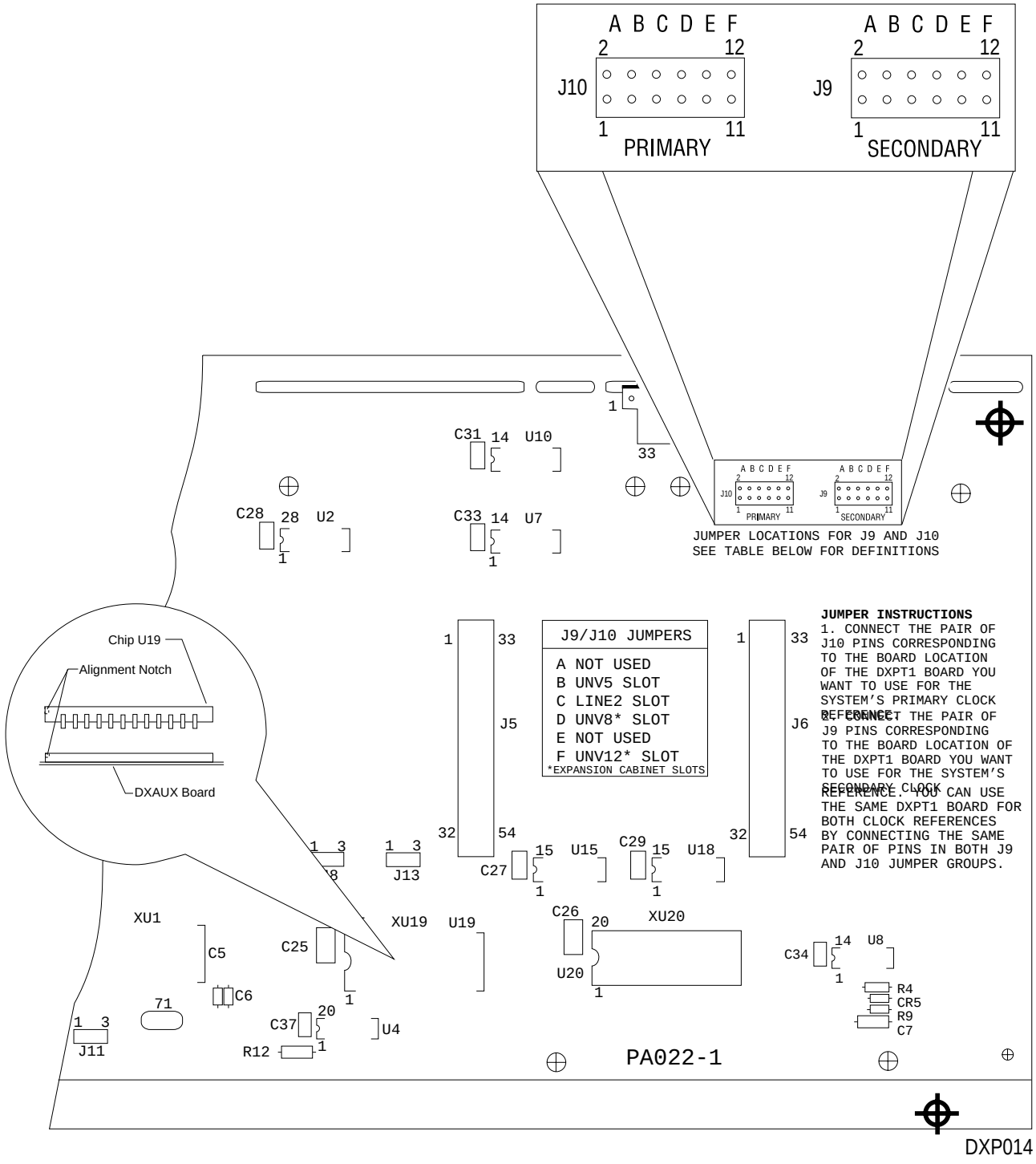
NOTE:If you install more than one DXPT1 board, designate one board slot location as primary and the other one as secondary. Then, set the jumper on the pair of J9 pins corresponding to the board slot location you designated as secondary. Do not jumper more than one pair of J9 pins. If you installed only one DXPT1 board, you may set both the J9 and J10 jumpers for the board slot that the board is installed in. Even though there is only one clock source, the DXOPT-SYN card functions as though it is receiving two; that is, the system turns on both PRI and SEC LEDs on the front edge of the card.

5. Check the revision level of the integrated circuit component (IC chip) installed in U19 on the auxilairy board. If the revision level of the chip is lower than 4A, replace it with one of revision 4A or higher. When replacing the U19 chip, make sure to use your wrist strap and a chip removal tool. Figure 6 shows the exact location of chip U19 and illustrates its proper installation.
6. Orient the auxiliary board (with attached DXOPT-SYN card) with the top and bottom guides at either slot UNV1/AUX or slot UNV2/AUX in the main DXP cabinet. Press the board in firmly until its edge connector properly mates with the connector on the DXP back plane.

CAUTION

When pressing the auxiliary board into place, press only at the extractor locations. If you apply pressure at other locations, you may damage the board assembly.

7. Make a final inspection to ensure that the auxiliary board is located in the correct slot (UNV1/AUX or UNV2/AUX), oriented correctly, and mated properly. Then, install and tighten the supplied screws to secure the auxiliary board to the DXP cabinet.
8. Set the lower (larger) slide switch on the front edge of the DXOPT-SYN card to the **AUTO** position. Leave the upper (smaller) switch in either position as it has no effect when the automatic mode is selected.
9. If applicable, plug the power cable from the optional external battery assembly into the DXP power supply.
10. Connect the AC power cord to the AC wall outlet and turn the power switch on. If no alarms are on (red LEDs), and at least one of the green **PRI** or **SEC** LEDs is turned on, replace the DXP cover.



Detailing The Auxiliary Board Jumpers

6.0 Understanding The T1 Alarms And Indicators

Most of the T1 alarms and indicators (LEDs) are located on the front-edge panel of the DXPT1 board, while several are located on the front edge of the DXOPT-SYN card. The following sections discuss the alarms and indicators.

NOTE: Red /Yellow LEDs, when lit, indicate errors or non-standard configuration for normal operation.

Red Alarm (red LED) When this LED indicator is lit, the system cannot establish communications with the network.

Yellow Alarm (yellow LED) The yellow alarm is lit whenever the far end has lost synchronization to its incoming signal. In the superframe format, a transmitted yellow alarm has a zero (0) bit in the second bit position of every eighth-bit. In the extended superframe format, a transmitted yellow alarm consists of repeating 16-bit patterns containing eight binary one (1) bits followed by eight binary zero (0) bits on the facility data link.

Sync Alarm (red LED) This LED (labeled *SYNC LOSS*), when lit, indicates that the frame bit in the received data cannot be found.

Signal Alarm (red LED) The signal alarm (labeled *SIG LOSS*) turns on to indicate that the DXP has lost its incoming signal.

Blue Alarm (red LED) When this alarm indicator is lit, the alarm indication signal (AIS) consisting of all one (1) bits is being received to indicate that the far end has lost its received signal. The purpose of this signal is to maintain the system clocks during a link failure.

Bipolar Alarm (red LED) The system converts the digital bitstream in T1 communications to a bipolar format through a process called alternate mark inversion (AMI). The voltage polarity of the ones pulses (marks) alternates between *Plus* and minus with a zero (space) represented by no pulse. A bipolar violation occurs whenever two successive pulses are of the same polarity. This alarm LED indicates a bipolar violation (BPV) has occurred. It is important to note that BPV errors are not passed through regeneration points.

Cyclic Redundancy Check (red LED) When using the ESF format, the cyclic redundancy check (CRC) indicator lights whenever there is a discrepancy in the check sum received for an incoming frame from the originating system and the locally calculated check sum. This discrepancy indicates a data error in the received frame. The CRC is enabled by DIP switch SW2-4.

Slip (red LED) This indicator is turned on whenever a frame slip is detected. This is caused by the transmit clock not being synchronized with the receive clock.

Unlock (red LED) The transmit frequency (1.544 Mhz) is not locked with the receive clock when this indicator is lit.

B8ZS)/COFA (green LED) This is a dual-purpose indicator. Depending on how you set DIP switch SW2-6, this indicator reports either a change of frame alignment (COFA) at re-synchronization time (default setting) or bipolar 8-zero substitution (B8ZS) code words detected in the received data.

RLB, LLB, and PAYL (red LEDs) Whenever a loopback routine is active, either the remote loopback (RLB), local loopback (LLB), or payback loopback (PAYL) mode (selected by DIP switches SW2-7 and SW2-8) is indicated by the appropriate LED being lit.

PRI and SEC (green LEDs) The *PRI* and *SEC* LEDs on the DXOPT-SYN card light to indicate where the receive clock reference is originating from—the primary or secondary DXPT1 board location. When two or more DXPT1 boards are installed, you make the primary and secondary assignments via jumpers on the the DXAUX board. If only one DXPT1 board is installed, you can set the jumpers so that both LEDs will light.

UNLOCKED (red LED) When lit, the Unlocked LED indicates either the DXOPT-SYN card is defective or the receive frequency is out of tolerance (1.544 Mhz ± 200 Hz).

MANUAL (red LED) This LED, when lit, indicates that the manual mode has been selected via the ***AUTO/MANUAL*** mode switch on the DXOPT-SYN card. When you select the manual mode (normally for maintenance/troubleshooting), you can select either the primary or secondary timing reference by setting the ***PRI/SEC*** switch on the DXOPT-SYN card. For normal operation, select the automatic mode. Do not manually force the clock reference to primary or secondary if the appropriate green LED is not lit. This will cause the VCO oscillator to default to its minimum or maximum tolerance, and the T1 board(s) may not frequency-lock.

6.1 Viewing The DXPT1 Board Alarms And Indicators

LED*	LABEL	ERROR OR STATUS CONDITION WHEN LED IS LIT
●	(Status)	Rapid flash = defective board Steady on = board in wrong slot or board constraints violated Off with repeated five second blink on = normal operation (T1 trunk idle) On with repeated five second blink off = normal operation (T1 trunk busy)
●	Red	Communications with network cannot be established (out-of-service)
⊙	Yellow	Disruption in remote T1 service
●	Sync	Loss of sync with the incoming signal
●	SIG	Loss of incoming signal
●	Blue	Alarm indication signal (AIS) being received (indicates loss of signal at far end)
●	Bipolar	Bipolar violation detected
●	CRC	Cyclic redundancy check error in incoming frame if SW2-4 is enabled (ESF only)
●	SLIP	Frame slip detected
●	Unlock	Transmit frequency (1.544 MHz) not locked with receive clock
○	B8ZS/COFA	B8ZS/COFA (B8ZS zero suppress mode/change of frame alignment) per SW2-6
●	RLB	Remote loopback active
●	LLB	Local loopback active
●	PAYL	Payload loopback active
○		Diagnostics codes (for factory test only)
○		Diagnostics codes (for factory test only)
○		Diagnostics codes (for factory test only)
○		Diagnostics codes (for factory test only)
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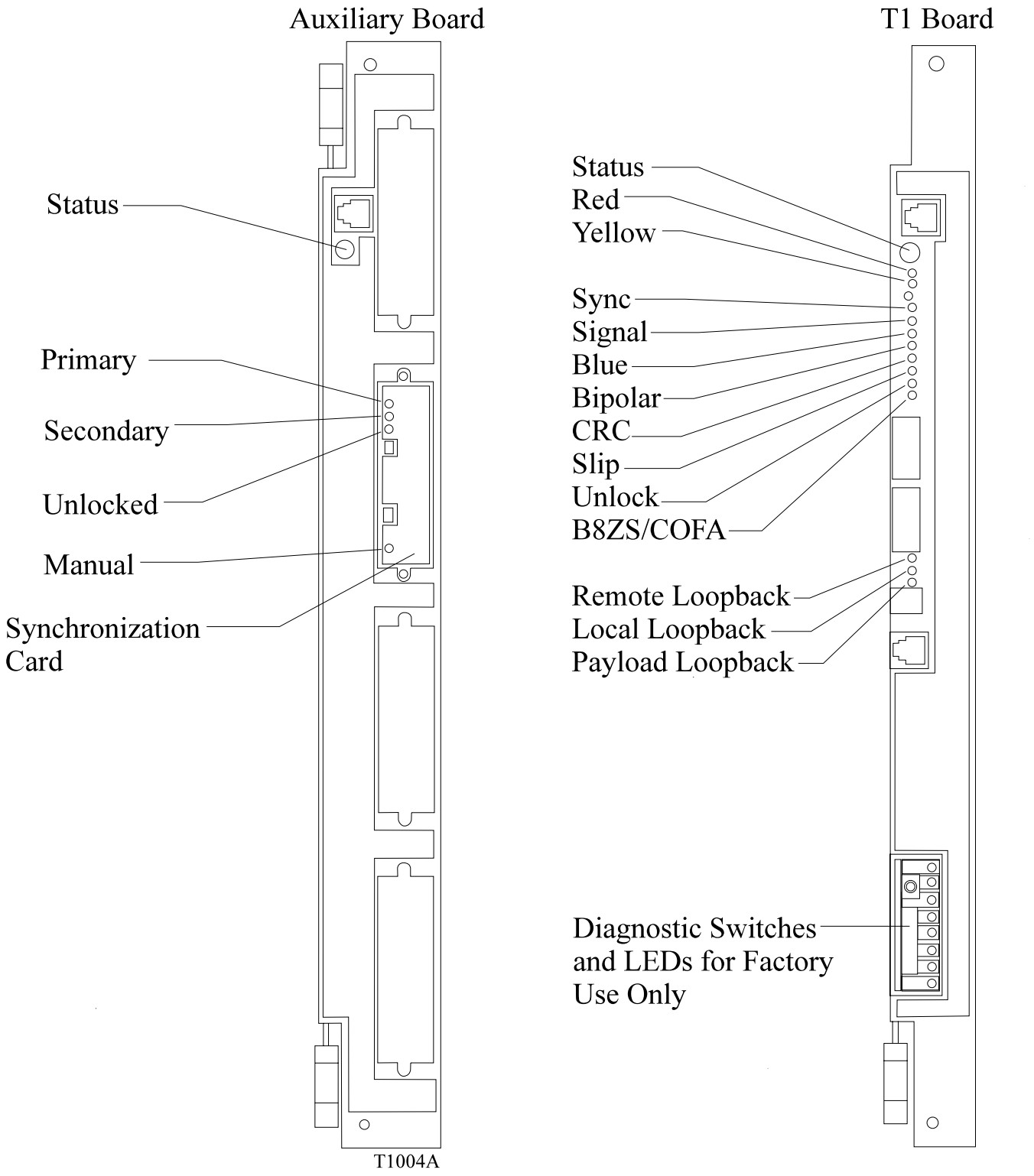
6.2 Viewing DXOPT-SYN Synchronization Card Alarms And Indicators

LED*	LABEL	ERROR OR STATUS CONDITION WHEN LED IS LIT
○	PRI	Timing reference is present from the DXPT1 primary board
○	SEC	Timing reference is present from the DXPT1 secondary board
●	UNLOCKED	Trouble (defective DXOPT-SYN card or receive frequency out of tolerance (1.544 MHz ± 200 Hz))
●	MANUAL	The manual mode is active for selecting the DXPT1 reference

NOTE: Red /Yellow LEDs, when lit, indicate errors or non-standard configuration for normal operation. Green LEDs indicate a normal condition.

*LED color legend

● = Red ⊙ = Yellow ○ = Green



Locating The Alarms And Indicators

7.0 Understanding Installer/User Information Regarding FCC Rules and Regulations

This electronic key system complies with Federal Communications Commission (FCC) Rules, Part 68. The FCC registration label on the DXP contains the FCC registration number, the ringer equivalence number, the model number, and the serial number or production date of the system.

7.1 Notification To Telephone Company

Unless a telephone operating company provides and installs the system, the telephone operating company which provides the lines must be notified before a connection is made to them. The lines (telephone numbers) involved, the FCC registration number, and the ringer equivalence number must be provided to the telephone company. The FCC registration number and the ringer equivalence number of this equipment are provided on the label attached to the common equipment. The user/installer is required to notify the telephone company when final disconnection of this equipment from the telephone company line occurs.

7.2 Compatibility With Telephone Network

When necessary, the telephone operating company provides information on the maximum number of telephones or ringers that can be connected to one line, as well as any other applicable technical information. The telephone operating company can temporarily discontinue service and make changes which could affect the operation of this equipment. They must, however, provide adequate notice, in writing, of any future equipment changes that would make the system incompatible.

7.3 Installation Requirements

Connection of the electronic key system to the telephone lines must be through a universal service order code (USOC) outlet jack supplied by the telephone operating company. If the installation site does not have the proper outlet, ask the telephone company business office to install one. The correct outlet jack for this system is either a type RJ21X or type RJ14C.

7.4 Party Lines And Coin Lines

Local telephone company regulations may not permit connections to party lines and coin lines by anyone except the telephone operating company.

7.5 Troubleshooting

If a service problem occurs, first try to determine if the trouble is in the on-site system or in the telephone company equipment. Disconnect all equipment not owned by the telephone company.
If this corrects the problem, the faulty equipment must not be reconnected to the telephone line until the problem has been corrected. Any trouble that causes improper operation of the telephone network may require the telephone company to discontinue service to the trouble site after they notify the user of the reason.

7.6 Repair Authorization

FCC regulations do not permit repair of customer owned equipment by anyone except the manufacturer, their authorized agent, or others who might be authorized by the FCC. However, routine repairs can be made according to the maintenance instructions in this publication, provided that all FCC restrictions are obeyed.

7.7 Radio Frequency Interference

The electronic key system contains incidental radio frequency generating circuitry and, if not installed and used properly, may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference to radio and television reception; in which case the user is encouraged to take whatever measures may be required to correct the interference. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient the television or radio's receiving antenna, and/or relocate the DXP, the individual telephone stations, and the radio or TV with respect to each other. If necessary, the user should consult the manufacturer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the Government Printing Office, Washington D.C. 20402. Stock No. 004-000-00345-4.

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This digital apparatus does not exceed the (Class A) limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le pre'sent appareil nume'rique n'emet pes de bruits radioe'lectriques de'passant les limites applicables aux appareils nume'riques (de la class A) prescrites dans le Re'glement sur le brouillage radioe'lectrique e'dicte' par le ministe're des Communications du Canada.

CAUTION

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

7.0 Knowing The Specifications

DXP Capacity	Four T1 boards (main LINE2, UNV5– expansion UNV8, UNV12)
Modes	Superframe, extended superframe
Framing	D4
Channels Allocated	8, 16, or 24
Industry Standards	ANSI T1.403-1989 AT&T PUB 62411
Maximum Output	2.4V to 3.6V base to peak, short circuit protection to 120 mA, rms
Line Rate	1.544 Mbps
Line Code	
Type	Bipolar AMI
Zero Suppression	B7 or B8ZS selectable
Receive Sensitivity	-26 dB or -36 dB selectable
Impedance	100 Ohms
DXP Loss Insertion	
Transmit	-6 dB (selectable to 0 and -3 dB per channel)
Receive	0 dB
T1 Connector	RJ48C, miniature 8-position, shielded (per ANSI T1-403, 1989)
T1 Cable	Up to 6,000 feet between DXPs, 22 AWG, twisted-pair, no external components
CSU Function	Built-in; CPE or CARRIER selectable (ESF)
Transmit Attenuation	
Manual	0, -7.5, -15, or -22.5 dB selectable
Automatic	Default
Input Jitter Tolerance	138 UI @ 1 Hz; 0.4 UI @ 10 KHz—100 KHz (0 dB line); corner frequency = 6 Hz (attenuates 20 dB per decade above corner)
Surge Protection	1 AMP fuse and transient protection for metallic >6 volts P-P; Longitudinal (tip—ring and chassis ground) protection 1500 volts minimum.
Elastic Store	Two frames, no frame loss when slipping
Compliance	FCC Part 68/Doc FCC Part 15 UL-1489/CSA (safety):

Yellow Alarm Type	
Superframe Mode	Bit 2 zero in all channels or Japanese 12th frame method, selectable
Extended Superframe Mode	Alternating bytes = all zeros and all ones; (prohibiting ANSI FDL messaging during yellow alarms is selectable)
Signaling	
Signaling Protocols	Loop Start (subscriber end) Ground Start (subscriber end) E & M Direct Inward Dial (DID)
Dialing	DTMF or Dial Pulse
Protocol Type (DID, E&M)	Wink, Delay-Dial, and Immediate Start (dial pulse only for immediate start)
DID Type Restriction	Limited to four of five types when mixing tone/dial pulse/wink/delay dial/immediate start)
Clocking	
Synchronization	Slave mode from DXOPT-SYN card on Auxiliary board
Min. RX Freq. Capture	1.544 MHz ± 200 Hz, T1 board; 16.384 MHz ± 2048 Hz, Sync card
TX Master Mode Freq.	1.544 MHz ± 75 Hz
Loopback Modes	
Superframe Mode	Local or remote loopback, manual Network loopback inband command; set 00001 5sec, reset 001 5 sec.
Extended Superframe Mode	Local, remote, payload loopback (manual) FDL ANSI network remote loopback FDL ANSI network payload loopback
LED Alarms/Errors	Status Red Alarm Yellow Alarm Blue Alarm Loss of receive synchronization Loss of signal Bipolar error(s) CRC errors (ESF) Slip errors Phase Lock error

8.0 Defining The T1 Terms

Bipolar
A bipolar signal is composed of alternating pulses that both represent a digital logic 1. The positive pulse is a (+) and the negative pulse is a (-). Zero volts represents a space, or digital logic 0.

Bipolar Violation (or error)
A bipolar error is a digital logic 1 (or mark) that has the same polarity as its predecessor.

NOTE: Every time the system regenerates the signal stream, it corrects any bipolar errors; therefore, it prevents end-to-end error checking from using bipolar errors.

B8ZS (Binary Eight Zero Substitution)
This is a technique to send an all-zero channel without violating the ones-density requirement (a single one in each channel and no more than 15 zeros in a row). Voice transmission will not allow an all zero channel. The system accomplishes B8ZS suppression by inserting a special bipolar error that is interpreted, not as an error, but an all zero channel. The B8ZS feature replaces the all-zero channel two different ways. The feature replaces the all-zero channel with the sequence 000 + - 0 - + if the preceding pulse was a +, and the feature replaces the all-zero channel with the sequence 000 - + 0 + - if the preceding pulse was -. The + represents a positive pulse, the - represents a negative pulse, and 0 represents no pulse. Set the B8ZS feature with switches SW1–5 and SW1–6.

CAS (Channel Associated Signalling)
The Channel Associated Signalling is the only inbound signalling method currently supported by the DXPT1 board.

COFA (Change of Frame Alignment)
When switch SW2-6 is off, the green LED on the DXPT1 indicates whether the network source or the network span caused the last frame synchronization. (This indication disregards the first re-sync at cold start or a system reset —cold start and reset causes the network source to re-sync.) A COFA occurs if the network source does a re-sync. The COFA is a diagnostic tool that identifies the source of the loss of frame synchronization.

CPE/Carrier Equipment
The DXPT1 is normally classified as Customer Premise Equipment (CPE). If you use SW2–2 to configure the DXPT1 board to use the internal CSU while in the ESF mode, the network may require that the system be classified as Carrier Equipment (CE). The information packet that the DXPT1 board sends to the network contains a facility data link (FDL) maintenance message that has a bit in it that provides this identification.

CRC (Cyclic Redundancy Check)
A method of checking errors from the transmission source to the destination. For T1 operation, CRC caculates a checksum depending on the data in a frame. The system uses CRC in ESF mode exclusively. (You must enable CRC with DIP switch SW2-4).

Delay Dial E&M, DID Protocol Type
Once seized by a calling system, the system being called makes A=1 and B=1 until it is ready to receive digits. When it is ready to receive digits, it makes A=0 and B=0. The system uses a delay dial protocol when wink protocol timing is not compatible to the network.

Dial Pulse – T1
Dial pulse is a method of sending address digits (numbers) using A and B bits logic bits instead of sending DTMF tones. Some carriers may not support dial-pulse signalling. While the method is slower when compared with tones, it requires no DTMF receivers.

Direct Inward Dial (DID) T1 Trunk
DID is a protocol for inbound calls where the network sends the extension number during the beginning of the call. The system supports the 0 through 7 inbound digits. The network does not translate the digits to a valid extension—the system's DID translation tables perform this action.

DS-0 (Digital Signal-Level Zero)
Digital Signal-Level Zero is a single 64Kbit channel inside a T1 span.

E & M T1 Trunk
E&M is a signalling protocol that supports both inbound and outbound digits. Inbound digits from the network are already translated to a 3–digit or 4–digit valid extension. E & M is symmetrical from both ends and ignores the subscriber/office classification of other trunks. Use this signalling protocol for interconnecting two DXP *Plus* systems.

Extended Superframe Mode (ESF)
Extended Superframe Mode consists of 24 frames. The frame bit uses only 6 frames leaving 18 bits for other purposes. These spare 18 bits provide 6 bits for CRC information and 12 bits for a facility data link. The facility data link is for maintenance information (as defined by the ANSI T1.403 specification). Like the superframe mode, the 64–Kbit user channels have 24 frames available for use.

Ground Start T1 Trunks
Ground start is a call signalling protocol that monitors only outbound digits and supports disconnect supervision. Ground start protocol supports only the subscriber end of the communications link

FDL (Facility Data Link)
The Facility Data Link is a 4–Kbit communication link from the network to the DXPT1 board only when the board is operating in the ESF mode. The system sends preemptive messages (for example, yellow alarm and loopback), if needed, and sends error packets to the network once a second. The packets contain alarm history in accordance with the ANSI T1.403 specification.

Fractional T1
Fractional T1 is a T1 span where the user uses less than 24 channels. The DXPT1 board allocates eight or 16 channels to a fractional T1 but does not reallocate unused channels in the eight, 16, or 24 mode to other resources. A fractional T1 in ESF mode will nullify the CRC and other error checking capability since the network shares channels.

Immediate Start Protocol State
Once a calling system seizes a called system, the calling system sends address digits to the called system without requiring an acknowledgement. Inbound immediate start protocol does not support tone dial. Dial-pulse is adequate however. Immediate start protocol is applicable to DID and E&M tie lines.

Inband Signalling
A signalling method where the system sends overhead signalling along with channel traffic.

ISDN (Integrated Services Digital Network) Primary Rate (also called PRI)
Currently not offered by the DXPT1 board.

Loopback Local
An operation method that loops the DXPT1 board's transmit output and receive input paths. The loopback terminates all traffic and halts call processing. While in this idle condition, the system continues to transmit the T1 transmit stream to the network but it will not answer incoming calls. If the remote T1 equipment is the clock source (primary or secondary) for the DXOPT-SYN card, the remote equipment terminates the reference signal because the network receive circuit is open in local loopback. You initiate local loopback by setting the appropriate SW1 switches. The main purpose of local loopback is to verify the DXPT1 board's ability to synchronize properly. Loopback local operation is applicable to superframe adn extended superframe modes.

Loopback Payload

The loopback payload feature is an ESF-only method of loopback which loops the network receive input path to the remote T1 equipment's transmit output path. This loopback method does not loop the first bit of each frame to allow the DXPT1 board's facility data link to continue to transmit maintenance information. You can use switches SW2–7 and SW2–8 to manually initiate the payload loopback or you can allow the network to send an FDL message to initiate or restore the payload loopback. The DXPT1 board goes out-of-service during the loopback time.

Loopback Remote

The loopback remote feature loops the network receive input path to the remote T1 equipment's transmit output path. The remote loopback feature terminates all traffic and halt any call processing. You can use the SW2 switches to manually initiate remote loopback or you can allow the network to remotely initiate the condition. In superframe mode with SW2–1 set to on, the network can send a special in-band pattern (00010001000100010001.... min 5 seconds) to cause the DXPT1 board to automatically enter the remote loopback mode. The network can disable the loopback by sending a different in-band pattern (001001001001001001001.... min 5 seconds). In ESF mode, the DXPT1 board's facility data link, or maintenance channel, can enable and disable remote loopback automatically or you can set SW2–7 on and SW2–8 off to manually enable remote loopback or set both switches off to manually disable the feature. Loopback remote operation is applicable to superframd and extended superframe modes.

LIU Line Interface Unit

The line interface unit is the interface between the T1 copper wires and the DXPT1 board's framing circuitry. The LIU is responsible for separating the 1.544MHZ receive clock from the incoming stream and converting bipolar Alternate Mark Inversion (AMI) to 5–volt digital logic. The LIU also supports the automatic line build-out that regulates the transmit level according to the receive strength (LIU-2 switch).

Loop Start T1 Trunk

Loop Start T1 Trunk is a network protocol that monitors outbound digits to the DXPT1 board. This protocol does not support disconnect supervision. Loop start protocol supports the subscriber end of the communications path but does not support the office (network) end.

Primary Clock Reference

The straps on the DXAUX board designate the primary clock reference. Primary clock reference is the first choice reference clock used to synchronize the DXP *Plus* to the incoming span. If the system looses synchronization, it uses its secondary clock reference. If the secondary clock reference is not available, the DXOPT-SYN card's variable clock oscillator (VCO) switches to the fixed oscillator on the DXSRV (services) board. When it does this, slips occur.

Repeater

A repeater is a amplifying device that central office technicians place at approximately one mile intervals along a T1 circuit to boost the T1 signal. The T1 specifications allow a maximum of 50 repeaters along a communications path.

Slip

This term describes the condition that exists when the transmit 1.544 MHz clock is different from the receive 1.544 MHz clock. When the system collects or looses a frame of information due to the span frequencies being different, the system generates a slip error. Slip does not affect voice transmissions and may not affect modem traffic; however slip does effect digital data traffic. The DXPT1 board does not currently support digital data traffic. Also, at times a central office takes a T1 span out of service if too many slips occur—one or two a day is permissible (the carrier supplier will furnish you with an an exact number if you request that information from them).

Smart-Jack (Network Interface Box)

A smart jack is a demarcation box provided by the central office. A smart jack provides isolation and increased signal drive (up to one mile) and can respond to loopback commands for diagnostic purposes. The central office usually provides an 8–pin modular jack for T1 equipment connection. Pin 1 of the modular jack goes to pin 1 of the DXPT1 modular jack, and so on. Only pins 1 and 2 (DXPT1 receive), 4 and 5 (DXPT1 transmit) require connecting.

Superframe Mode (SF)

The standard T1 mode consists of 12 frames per superframe cycle. The first frame bit remains constant and rotates through a 12-bit pattern. By identifying the frame pattern, the system can select the sixth and twelfth frame for the AB bit signalling inband method. T1 parameters allow for 24 64–Kbit user channels.

Suppression

Suppression is a means to prevent more than 15 zeros in a row and not less than 1 pulse (mark) per channel. The DXPT1 board supports two suppression methods. These are the B7 method and the B8ZS method (selected by SW1–5 and SW1–6). The B7 method inserts a logic 1 in the seventh bit position of a channel if all bits are zeros. The B8ZS method inserts a bipolar violation that will be identified and stripped at the receiving end (selected by switches SW1–5, and SW1–6). Voice coding should not allow an all zero channel.

Unlock Alarm

On a normally operating DXPT1 board, the unlock alarm LED is always off. If this LED is on, it indicates that the phase lock loop creating the transmit 1.544 MHz frequency is defective. For this indicator to be meaningful, the DXOPT-SYN card must be synchronized (no red LEDs on). If the DXOPT-SYN card is not synchronized, you must correct that situation.

Wink E&M, DID Protocol State

This effect is a quick response by a called system (A=1, B=1) to a calling system that seized the line. The response indicates that the called system is ready to receive address digits.

Yellow Alarm

The yellow alarm indicates that the network has lost its incoming frame synchronization. The DXPT1 board signalling is inactive for approximately three to four seconds during this alarm time, and the system halts all call processing. If the system clears the received yellow alarm within the time limit, the DXPT1 board's inactive state terminates and call processing continues.

The system sends a yellow alarm to the network if it loses incoming frame synchronization or if the DXPT1 loses communications to the CPU board. Received and transmitted yellow alarms can not exist at the same time. If such a situation occurs, the system inhibits the transmitted alarm.

ZBTSI (Zero Byte Time Slot Interchange)

Zero Byte Time Slot Interchange is a complex technique to insure that the T1 transmission meets the pulse density requirement. This ZBTSI technique is unpopular in the telephone industy, and the DXPT1 board does not support the feature.

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Installing and Programming The ISDN–PRI Interface In The DXP Digital Communications System

Introducing The ISDN–PRI Interface

Integrated Services Digital Network (ISDN) provides integrated voice and data over a common telephone company facility. There are two methods of ISDN access that are currently available: ISDN–BRI (basic) and ISDN–PRI (primary). ISDN–BRI provides a way for subscribers to get digital service from the telephone company supplier for two telephones or a telephone and a data device over one special pair of wires. ISDN–PRI provides a way for subscribers to get digital service from the telephone company supplier for 24 lines over two special pairs of wires. This latter method is the concern of this publication.

ISDN–PRI access directly connects a multiple-station, digital communications system to the telephone company's ISDN network through a single high-speed line. This high-speed line is commonly known as T1 in North America and consists of 24 digitized channels. ISDN–PRI access consists of a grouping of 23 voice channels (B–channels) and one signalling or control channel (D–channel). B–channels are clear channels suitable for voice or data transmission while the D–channel is a packet-switched link for call set-up and signalling. When you use ISDN–PRI access with T1, one of the T1 channels serves as the signalling channel. This arrangement is sometimes referred to as 23B+D ISDN service.

The DXPRI is a circuit card that you install on a revision B or later DXPT1 line board with special-purpose firmware to provide ISDN–PRI access to the digital communications system. The DXPRI card handles the D–channel signalling protocol and passes messages to the DXPT1 board. A single DXPRI card can control multiple DXPT1 boards when installers tie the boards together through board programming action. This arrangement (known as NFAS or Network Facility Associated Signalling) allows the system to derive 24 B–channels from all boards except the one channel that it needs for signalling. When installers do this, the DXPT1/DXPRI combination that provides the control is designated as DXPT1–PRI; and the boards being controlled are designated as DXPT1–NFAS. The NFAS boards do not require a DXPRI card as they are slaves to the master –PRI board. Throughout the remainder of this publication, the term T1/PRI means a T1 board specifically configured for ISDN–PRI operation be it either a DXPT1–PRI or a DXPT1–NFAS board.

Since central office protocols differ, the DXPRI card supports several protocol arrangements and provides interface support for several signalling types. The programmer and the end user can select the interface support that the system needs for a particular application. The support that they choose determines the way that the telephone company treats the signal.

The DXPRI card provides a calling number identification feature that provides the following services: delivery of network provided calling numbers, calling line identification presentation (CLIP), or automatic number identification (ANI). On originated calls, the system automatically provides the calling number if available; otherwise, it provides the default directory number. For incoming calls, the called station displays the calling number if available; otherwise, the display shows information determined by station class of service programming. The system programmer can customize the caller ID parameters for outgoing calls as site requirements dictate.

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Introducing The T1/PRI Line Board

The revision B or later DXPT1 board with special-purpose firmware serves as host for the DXPRI card and gives the digital communications system the capability to handle up to 24 channels of voice and/or data transmissions over a single four-wire cable using multiplexing techniques. The DXPT1 board includes a customer service unit (CSU) to eliminate the need for a external CSU.

Defining T1/PRI Operation

T1/PRI is the digital two-way transmission of telecommunications over a single high-speed circuit. Up to 24 separate voice or data transmissions form digital pulses that are transferred at the rate of 1.544 million bits per second (Mbps) over the T1/PRI trunk. At the receiving end, the digital pulses are decoded into 24 separate circuits.

Pulse characteristics such as repetition rate, pulse width, pulse amplitude, and average ones density ((ratio of one (1) bits to zero (0) bits)) are as specified by digital signal level 1 (DS-1) described in American National Standards Institute Specification, ANSI T1.403-1989.

Detailing Where You Can Install T1/PRI Boards and Its Supporting Needs

The DXP supports a maximum of 128 lines and each T1/PRI board handles 24 channels, and this combination determines the number of boards that you can install in the system. Of course, any other line boards that you install, such as loop start, DID or multipurpose, reduce the number of lines available for T1/PRI service and thus reduces the number of T1/PRI boards that you can install.

You can place T1/PRI boards in physical board slots 3, 5, and 8 in the main cabinet and physical board slots 12, 14, and 16 in the expansion cabinet. There are certain installation considerations associated with T1/E1 board placement.

- When a 24-port T1/E1 board occupies physical slots 3, 5, 12, 14, and 16, any analog line board type can occupy physical slots 2, 4, 11, 13, and 15.
- When a 24-port T1/E1 board occupies physical slot 8, any analog line board type can occupy physical slot 6; however, no board of any type can occupy physical slots 7 and 9.

Whenever you install one or more T1/PRI boards, and the DXP is receiving its timing signals from an external source, you must install one synchronization card (DXOPT–SYN) on the auxiliary board. This means that when you connect the system to central office (CO) lines, you must include a synchronization card, and the DXP clock must be controlled by CO signalling.

If you are unfamiliar with the terms and component names associated with the T1/PRI digital carrier transmission option, refer to paragraph titled, *Defining The T1/PRI Terms*, at the end of this publication.

CAUTION

For operation with the DXP, the T1/PRI board must be Revision B or higher and have special-purpose firmware installed.

Understanding The DXOPT-SYN Synchronization Card

The DXOPT–SYN card uses a reference timing frequency of 8 KHz that it derives from the 1.544 MHz frequency supplied to the T1/PRI board by the central office (CO) or other external source. By referencing this 8 KHz with 8 KHz timing derived internally, the master 16.384 MHz voltage-controlled oscillator (VCO) can be synchronized. The transmit clock (1.544 MHz) is derived from the 16.384 MHz frequency on the T1/PRI board. If the 1.544 MHz received frequency is incorrect (not within a 200 Hz tolerance), the system may loose synchronization with the CO or other external source. The DXOPT–SYN card reports this condition by turning on the appropriate alarms on the T1/PRI board and DXOPT–SYN card. A loss of clock synchronization causes frame slips that result in data communications errors.

The DXOPT–SYN card allows two timing references (primary and secondary) to be selected. You can select either automatic or manual (for maintenance mode). In the automatic mode, a loss of primary timing causes the system to switch to the secondary timing reference. If both the primary and secondary timing references are lost, the VCO oscillator on the DXOPT–SYN card is defaulted to the fixed 16.384 MHz oscillator on the services board. This results in the loss of clock synchronization.

Configuring The T1/PRI Board

When the factory arranges the T1/PRI board for ISDN–PRI support, it installs the DXPRI card and the appropriate chip firmware on both boards. For field up-grade of existing T1 boards, you must install the DXPRI card on your existing DXPT1 board and change the firmware on the DXPT1 board. For instructions to do this, refer to the paragraph titled *Up-Grading Your DXPT1 Board For ISDN–PRI Support*, located at the end of this publication.

Before you install a T1/PRI board in the digital communications system, determine if you must meet special system requirements. If you do have special system requirements, use the dual in-line pin (DIP) switches provided on the board to re-configure the T1/PRI board.

The board contains 28 DIP switches (three 8-position modules and one 4-position module). Rectangular cutouts in the front-edge panel provide access to these switches.

The eight DIP switches nearest the bottom of the panel are accompanied by eight green LED indicators.

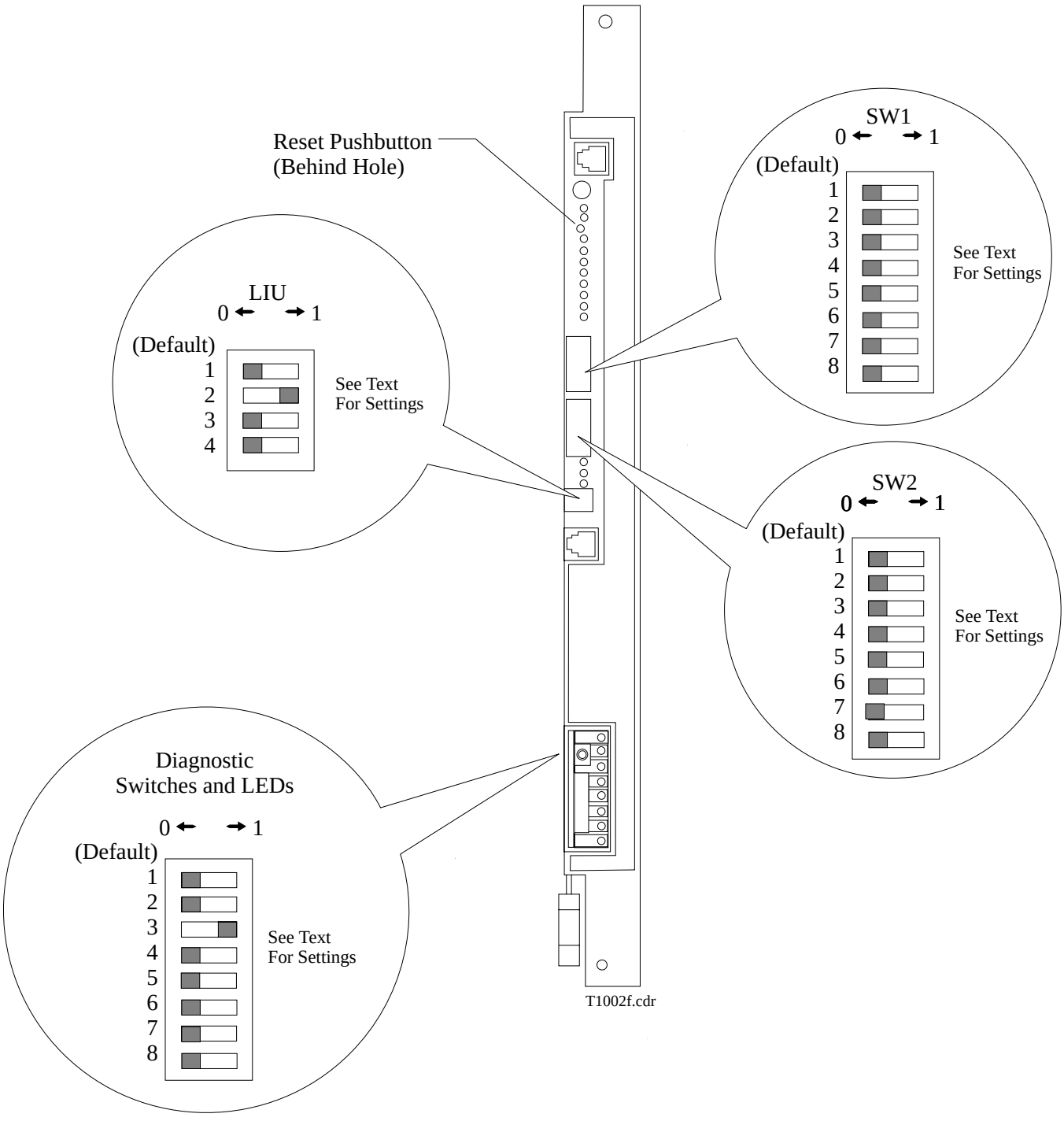
NOTE: These eight switches and their associated indicators are for diagnostic purposes only. The setting of these switches does not affect the function of the T1/PRI board. The recommended setting for switches 1,2, and 4–8 is 0 and the setting for switch 3 is 1. These settings cause the green diagnostic lights to give information about PRI layer 2 and 3 operation.

The remaining 20 DIP switches labeled SW1, SW2. and LIU are for configuring the T1/PRI board to meet specific operating requirements. The default setting for all of these switches is 0 except for LIU–2, which you should set to 1. This is the standard configuration for most customer applications. However, special customer needs may require that you reset one or more of these switches using the procedure given below.

1. Obtain a static discharge wrist strap and attach it to one of your wrists. Make sure to adjust the strap for a snug fit against your skin; do not apply the strap over any of your clothing.
2. Connect one end of the wrist strap-cord to the wrist strap and the other end to earth ground.

NOTE: With the DXP cabinet in the installed position, the ground lug on the right side of the cabinet is normally a good grounding point since this lug should have a heavy ground wire connected between it and a good earth ground.

3. Remove the T1/PRI board from its static protection bag and set it on a static-safe work area.
4. Using a ball-point pen or similar object, move the DIP switches from left (0 position) to right (1 position) as needed. All DIP switches are facing left for typical applications. The paragraph titled, *Setting The T1/PRI Switches*, details the DIP switch descriptions



Setting The DIP Switches

Setting The T1/PRI Switches

NOTE: The system only reads the SW1, SW2, and LIU DIP switches when you apply power to the board or do a manual reset. With power on, manually reset the board by inserting a slender object, such as a straightened-out paper clip, into the small hole located between the Yellow and Syn LEDs on the front-edge panel. You can also reset the board remotely from a video display terminal or personal computer. A reset causes a service disruption.

Setting Switch Options SW1–1 Through SW1–8

Down-Load PRI Code To Flash

The DXPRI card has internal software that resides in FLASH memory that you can up-grade from the DXP serial data port. You must set SW1–8 for down load or for normal operation.

SW1 DIP Switch Number	Switch Position	Function
1 (top)	0 (default)	Reserved for future use.
2	0 (default)	Reserved for future use.
3	0 (default)	Reserved for future use.
4	0 (default)	Reserved for future use.
5, 6, 7	0 (default)	Reserved for future use.
8	0 (default) 1	Down-load PRI Code To Flash Normal (run) Down-load

Setting Switch Options LIU–1 Through LIU–4

Receive Sensitivity

The equalizer gain logic (EGL) determines how sensitive the receive circuits are to the incoming signals. You set the level for -26 dB or -36 dB by using DIP switch LIU–1. (Normally, the -26 dB level setting is the better choice.)

Transmit Level Attenuation

You can manually set the transmit level for a particular value (0, -7.5, -15, or -22.5 dB) or select the automatic feature that sets the transmit level automatically depending on the receive signal. A weak receive signal causes a strong transmit signal and vice versa. Use DIP switch LIU–2 to select either the manual or the automatic setting. If you select the manual setting, set the desired value with DIP switches LIU–3 and LIU–4. Normally, 0 dB is used when connecting to a network interface box.

LIU DIP Switch Number	Switch Position	Function
1 (top)		RECEIVE SIGNAL SENSITIVITY
	0 (default)	-26 dB
	1	-36 dB
2		TRANSMIT LEVEL MODE
	0	Automatic (level set by receive signal)
	1 (default)	Manual (level set by switches 3 and 4 below)
3,4		TRANSMIT LEVEL ATTENUATION (LIU-2 must be “1")
	0,0 (default)	0 dB
	0,1	-7.5 dB
	1,0	-15 dB
	1,1	-22.5 dB

Setting Switch Options SW2–1 Through SW2–8

Loop-back

Loop-back is the maintenance routine used to verify the receive function (local or remote) and to isolate system problems. The network can remotely activate the loop-back feature using ESF (ANSI T1.403) facility data link.

You can manually make three different types of loop-back requests depending on the option you select using DIP switches SW2–7 and SW2–8. These are: local, remote, and payload loop-back.

- Local loop-back returns transmitted signals back to the DXP.
- Remote loop-back returns received signals back to the network. The ANSI T1.403 specification refers to this feature as line loop-back.
- Pay-load loop-back is similar to remote loop-back except the system reestablishes framing bit.

Customer Service Unit (CSU) Identification Bit

You can set the message-oriented (C/R) bit transmitted over the ESF data link by DIP switch SW2–2 to be a zero (0) bit or a one (1) bit. The C/R bit is used to identify the T1 signal origin as being either from customer premise equipment (CPE) or carrier equipment such as a CSU.

Set C/R to be a zero (0) bit for customer premise equipment (CPE) or when using an external CSU (default).

Set C/R to be a one (1) bit if the network requires the T1 internal CSU to be classified as carrier equipment.

Cyclic Redundancy Check (CRC-6)

This is a method for checking the accuracy of data transmissions when using the ESF format. This method uses a polynomial algorithm based on the content of a super-frame of data. When CRC-6 checking is enabled via DIP switch SW2–4, an alarm will be activated whenever a CRC code (checksum) is received over the ESF data link that does not match the locally calculated code (checksum).

Yellow Alarm During ANSI Messages On The Facility Data Link

The facility data link is available for reporting transmission performance information once a second. Normally, these transmissions are inhibited by yellow alarms. However, you can set DIP switch SW2-5 to allow these transmissions during yellow alarms.

Green B8ZS/COFA LED Definition

The green LED on the DXPT1 board's edge-panel labeled "B8ZS/COFA" indicates either that B8ZS code words are being received or that a change of frame alignment (COFA) occurred during the last synchronization by the external T1 source or carrier equipment. You can determine which condition you want reported by how you set DIP switch SW2–6. The default setting is for "COFA" reporting.

SW2 DIP Switch Number	Switch Position	Function
1 (top)		Reserved for future use.
	0 (default)	reserved
	1	reserved
2		CSU ID (C/R) BIT (ESF MODE)
	0 (default)	C/R bit = 0 designates customer premise equipment (CPE)
	1	C/R bit = 1 designates carrier equipment
3		Reserved for future use.
	0 (default)	reserved
	1	reserved
4		CRC (CYCLIC REDUNDANCY CHECK)
	0 (default)	disabled
	1	enabled
5		FDL YELLOW ALARM DURING ANSI MESSAGES
	0 (default)	disabled
	1	enabled
6		B8ZS/COFA LED DEFINITION
	0 (default)	COFA (change of frame alignment)
	1	B8ZS detect
7,8		MANUAL loop back REQUEST
	0,0 (default)	no loop back
	0,1	local loop back request
	1,0	remote loop back request
	1,1	payload loop back request

Installing The Synchronization Card On The Auxiliary Board

Whenever you install one or more T1/PRI boards, and the DXP is receiving its timing signals from an external source, you must install one synchronization card (DXOPT–SYN) on the auxiliary board using the following procedure.

NOTE: Whenever you install one or more T1/PRI boards, and the DXP is receiving its timing signals from an external source, you must install one synchronization card (DXOPT–SYN) on the auxiliary board. When you connect the system to central office (CO) lines, you must include a synchronization card, and the CO signalling must control the DXP.

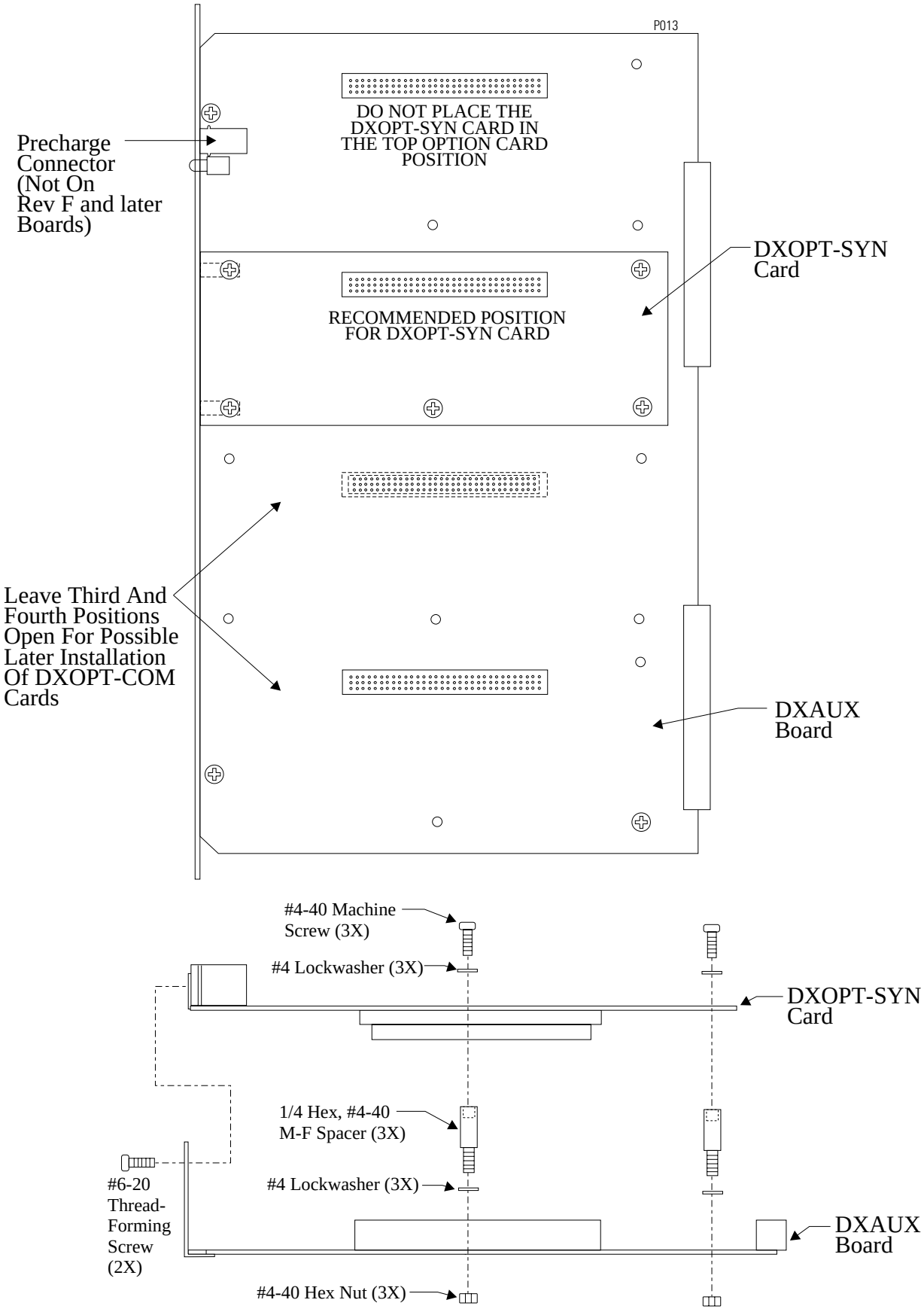
1. Switch off the DXP power supply, disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground
3. Loosen the retaining hardware and lift the front panel away from the common equipment cabinet.

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

CAUTION

Do not remove or install the auxiliary board while the DXP is powered-on or severe system problems may occur.

4. Locate the auxiliary board, loosen the retaining screws, remove it from the main cabinet, place it in a static protection bag, and transport it to the static-safe work area.
5. At the static-safe work area, with your wrist strap in place, remove the auxiliary board and the DXOPT–SYN card (if used) from their static protection bags.
6. Refer to the illustration, and install the DXOPT–SYN card at the **second** position on the auxiliary board with the supplied hardware.


P013
DO NOT PLACE THE DXOPT-SYN CARD IN THE TOP OPTION CARD POSITION
Precharge Connector (Not On Rev F and later Boards)
DXOPT-SYN Card
RECOMMENDED POSITION FOR DXOPT-SYN CARD
Leave Third And Fourth Positions Open For Possible Later Installation Of DXOPT-COM Cards
DXAUX Board
#4-40 Machine Screw (3X)
#4 Lockwasher (3X)
DXOPT-SYN Card
1/4 Hex, #4-40 M-F Spacer (3X)
#6-20 Thread-Forming Screw (2X)
#4 Lockwasher (3X)
DXAUX Board
#4-40 Hex Nut (3X)

Installing The Synchronization Card On The Auxiliary Board

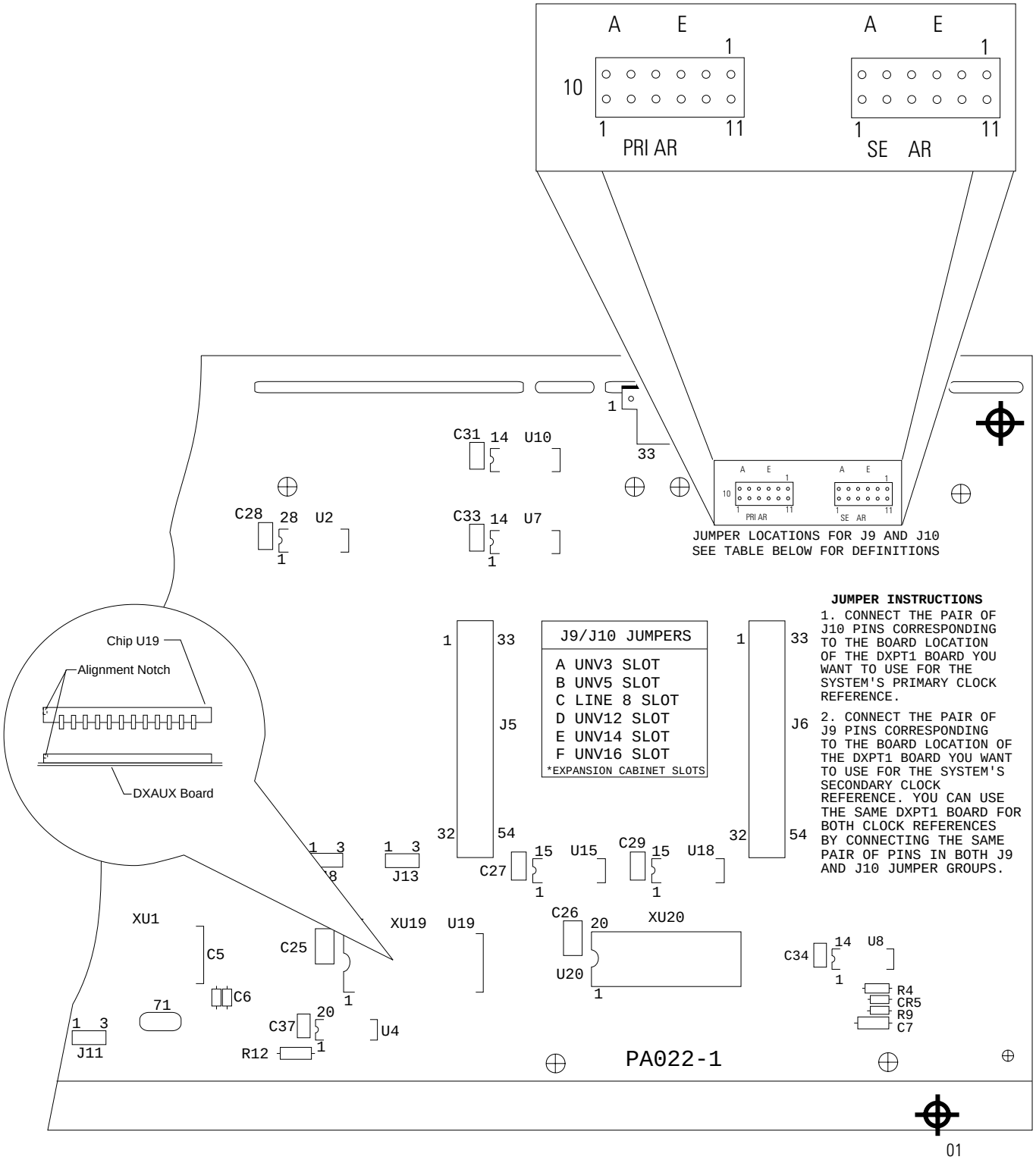
Setting The Auxiliary Board Jumpers

On the auxiliary board, set the jumper on the pair of J10 (primary) pins corresponding to the DXP cabinet slot where you will install the T1/PRI board. Do not jumper more than one pair of J10 pins. This designates the primary clock source for the DXOPT-SYN card

NOTE:If you install more than one T1/PRI board, designate one board slot location as primary and the other one as secondary. Then, set the jumper on the pair of J9 pins corresponding to the board slot location you designated as secondary. Do not jumper more than one pair of J9 pins. If you installed only one DXPT1 board, you may set both the J9 and J10 jumpers for the board slot that the board is installed in. Even though there is only one clock source, the DXOPT-SYN card functions as though it is receiving two; that is, the system turns on both PRI and SEC LEDs on the front edge of the card.

Check the revision level of the integrated circuit component (IC chip) installed in U19 on the auxiliary board. If the revision level of the chip is lower than 4A, replace it with one of revision 4A or higher. When replacing the U19 chip, make sure to use your wrist strap and a chip removal tool. The illustration shows the exact location of chip U19 and illustrates its proper installation.

When you finish setting the jumpers, place the auxiliary board with the newly installed DXOPT–SYN card into a static protection bag and transport the assembly to the main cabinet.



Detailing The Auxiliary Board Jumpers

Installing Circuit Boards

CAUTION

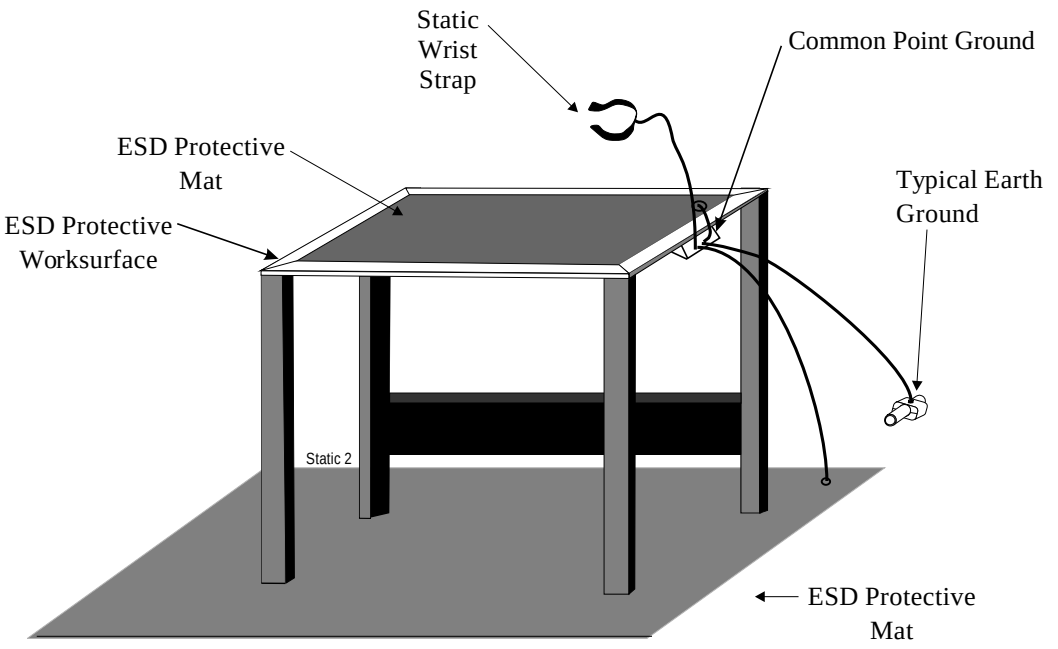
Circuit boards are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, *for general information. Specific handling precautions are also included in this installation instruction.*

Creating A Static Safe Work Area

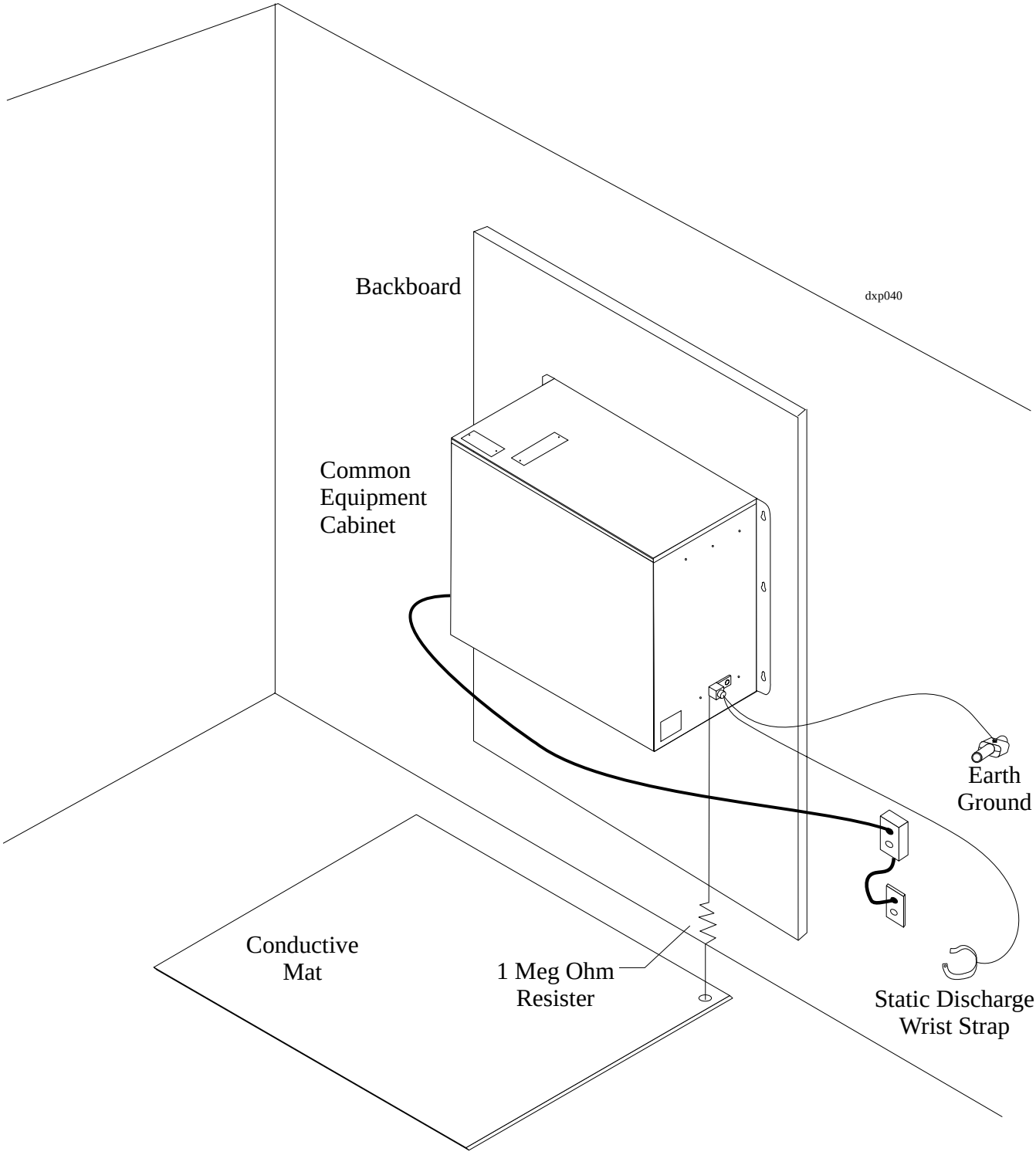
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Creating A Static Safe Work Area



Providing Static Protection At The Cabinet Mounting Location

Installing The T1/PRI And Auxiliary Boards

NOTE: If you ever find it necessary to field-install a DXPRI card on a T1 board, refer to the paragraph titled, Up-grading Your DXPT1 Board For ISDN–PRI Support, *that is located at the end of this publication.*

1. Normally you should disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply; however, when necessary, you can install a T1/PRI board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the pre-charge port on the power supply. During step 6, you will connect the other end of this coil cord to the pre-charge jack on the line board.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground
3. Loosen the retaining hardware and lift the front panel away from the common equipment cabinet.

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

4. Each board is supplied in a static protection bag for safe keeping. When you are ready to install the board, remove it from its static protection bag.

CAUTION

If you are up-grading the software of a DXP to support T1/PRI operation from software that is earlier than revision 10A, you will find that the up-grade software changes the system's board layout. The software up-grade includes a new board label that you must install on the equipment cabinets. This new label details the proper board slot locations. Currently produced DXP systems have the proper location labels factory installed.

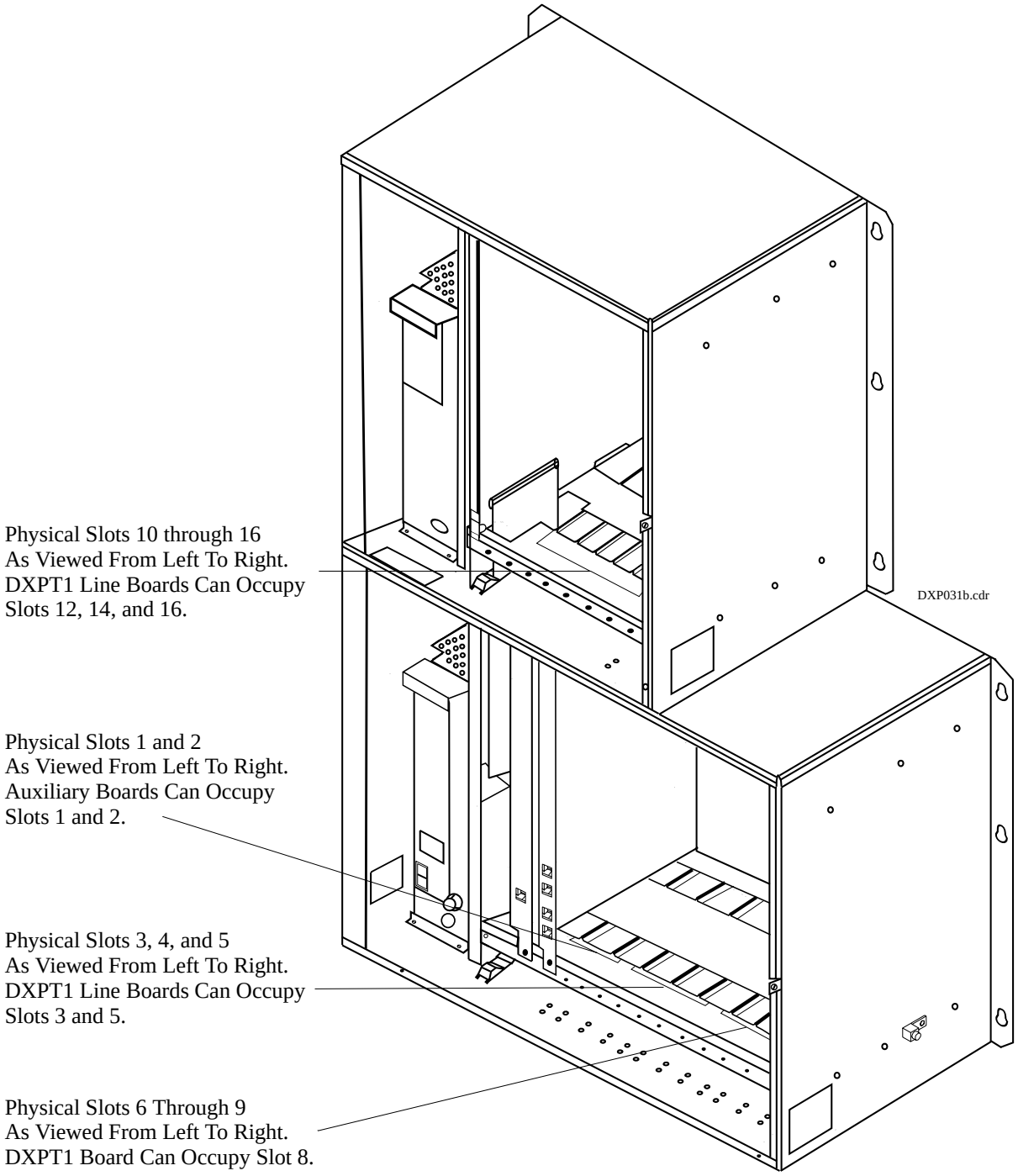
5. You can place T1/PRI boards in physical board slots 3, 5, and 8 in the main cabinet and physical board slots 12, 14, and 16 in the expansion cabinet. There are certain installation considerations associated with T1/PRI board placement.
   - When you install a 24-port T1/PRI board in physical slots 3, 5, 12, 14, and 16, you may install any analog line board type in physical slots 2, 4, 11, 13, and 15.
   - When you install a 24-port T1/PRI board in physical slot 8, you may install any analog line board type in physical slot 6; however, you **must not** install a board of any type in physical slots 7 and 9.
6. If you are installing the board in an operating system, connect the free end of the pre-charge cord that you installed in step 1 to the pre-charge jack on the line board.
7. Orient the board with its top and bottom guides in main cabinet board cage, and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane. If you connected a handset cord between the pre-charge port on DXP power supply and the jack on board. Disconnect it after installing board.

CAUTION

When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

8. With your static discharge wrist strap still properly installed, follow the directions of step 7, and install the auxiliary board in the main cabinet.
9. If the installation includes a DXOPT–SYN card, make sure the lower (larger) slide switch on the front edge of the card is in the up **AUTO** position. Leave the upper (smaller) switch in either position as it has no effect when the automatic mode is selected.
10. Make a final inspection to ensure that all the boards are oriented correctly and mated properly.

11. Install and tighten the supplied screws to secure the board assembly to the board cage. **Do not neglect this step!** It is important because it helps in providing a protective ground condition for the board thus ensuring RFI (radio frequency interference) and lightning protection.
12. If applicable, plug the power cable from the optional external battery assembly into the DXP power supply.
12. Connect the ISDN–PRI line to the system. (You may need to refer to the discussion on the next page titled *Connecting The ISDN–PRI Line To The System* for complete details.)
14. Connect the AC power cord to the AC wall outlet and turn the power switch on. If no alarms are on (red LEDs), and at least one of the green **PRI** or **SEC** LEDs is lit, replace the cabinet's front panel; otherwise, troubleshoot the installation for errors.


Physical Slots 10 through 16
As Viewed From Left To Right.
DXPT1 Line Boards Can Occupy
Slots 12, 14, and 16.
DXP031b.cdr
Physical Slots 1 and 2
As Viewed From Left To Right.
Auxiliary Boards Can Occupy
Slots 1 and 2.
Physical Slots 3, 4, and 5
As Viewed From Left To Right.
DXPT1 Line Boards Can Occupy
Slots 3 and 5.
Physical Slots 6 Through 9
As Viewed From Left To Right.
DXPT1 Board Can Occupy Slot 8.

Installing The Circuit Boards

Connecting The ISDN–PRI Line To The System

Terminate the end of the ISDN–PRI line with a miniature 8-pin modular plug, and plug it into the main jack on the front edge of the T1/PRI board.

The T1/PRI board contains a built-in CSU that protects the DXP from voltage surges, provides transmission drive up to 6,000 feet, and performs diagnostic tests for the network. Therefore, a customer-supplied CSU is not necessary unless your customer requires this addition.

If a direct connection to a repeater is within a few hundred feet, the transmit signal from the T1/PRI board may overdrive the repeater. Repeaters normally operate best with -7.5 to -23 dB input signals. Arrange LIU switches 2, 3, and 4 to set the transmit signal level (0 dB is default).

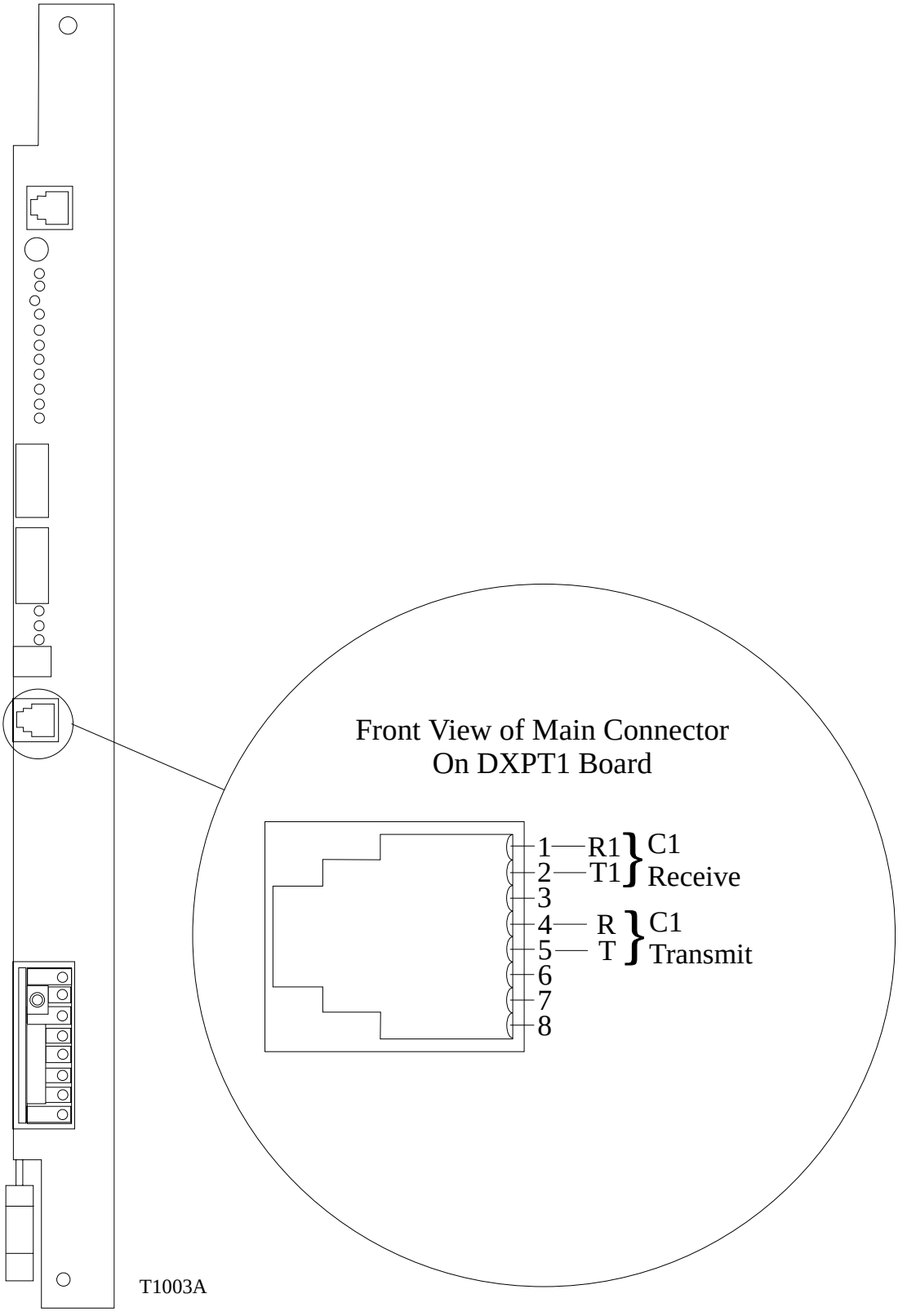
IMPORTANT CAUTION

To help ensure that external over-voltage surges do not damage the system, Comdial advisors suggest that you install a properly-grounded gas discharge tube or a similar primary protection device on the T1 trunk where it enters the building. If the site includes a network interface box, verify that there is standard lightning protection installed externally to the box on its network side. Primary protection where the cable enters the building is necessary to prevent a fire hazard inside the building.

Detailing the Cable Requirements

Normally, the ISDN–PRI connection to a central office is via a network interface box (smart jack). The box is usually small with an 8-pin modular telephone jack for connecting to the customer premise T1 equipment. For short lengths of approximately 200 feet or less, use a standard telephone cable with an 8-pin modular plug for connection to the T1/PRI board. Make straight-through connections for pins 1, 2, 4, and 5 when using these plugs on both ends of the cable.

When spanning distances greater than 200 feet, use a low-capacitance cable (data-grade cable) having two twisted, solid-conductor wire pairs with shielding. The type of cable with metal shielding covering each twisted pair provides the best immunity from electrical interference. Only connect the shielding to earth ground at one end of the cable—do not ground the shielding at the other end of the cable.



Connecting The ISDN–PRI Line To the T1/PRI Board

Programming The System For ISDN–PRI Application

To arrange the DXP system for ISDN–PRI operation, you must take the following programming actions:

- Use Board configuration programming to program the ISDN service features.
- Use Line programming to make every ISDN line a PRI B Channel line type and make the DID/DNIS programming choices.
- Use Line group programming to group together the lines that correspond to the T1/PRI channels.
- Use Station programming menu to program the specific ISDN requirements in addition to the other station programming needs.
- Use Button mapping programming to map a restrict button on the ISDN station.
- Use Features numbering to add dialing codes for two ISDN-specific features.

Board Configuration

When you add a T1/PRI board in a common equipment cabinet board slot, that slot becomes programmable, and you can make several programming choices that affect ISDN–PRI service.

Protocol—With the Protocol feature, match the software to the central office (CO) switch type. The switch types that the software supports include the following items:

4ESS (AT&T* 4ESS switch protocol)
5ESS (AT&T* 5ESS switch protocol)
DMS100 (Northern Telecom** DMS100 switch protocol)

** Lucent Technologies, Murray Hill, NJ 07974*
***Northern Telecom Limited, Richardson TX 75082*

Default Number—This feature allows you to select a default value for the Calling Number ID. The system uses this number to identify the calling party in the following cases: when you use the Calling Number ID Mode feature to specify board level identification, when you do not program a calling number identification for a station (see Station Programming for details), and when the call is a line-to-line call through the system.

Calling Number ID Mode—This feature allows you to set calling number identification at either a board level or a station level. The selections include the following choices:

Default Number (selects board level identification such as the company's main number)
Station Number (selects station level identification—requires that you program the Outbound Calling Number ID and Station ID features in Station Programming)
Default With Station ID (future feature—selects board level identification for the calling number ID plus th station ID if available.)

NFAS Membership Mode—Use this feature to specify a board's role in a NFAS group.

Non-Member (specifies independent, stand-alone DXPT1–PRI board)
Member (specifies DXPT1–NFAS board with D-channel signalling provided by another board)
Primary (specifies DXPT1–PRI board that provides D-channel signalling for the NFAS group)

NOTE: When you are using Visual Man-Machine Interface (VMMI) to program, the system automatically applies the Member setting where appropriate.

Primary D-Channel Board—Designate the board that provides the D-channel signalling for a NFAS group with this programming feature. Make the same designation for every board in a NFAS group including the primary board.

NOTE: When you are using Visual Man-Machine Interface (VMMI) to program, the system automatically applies the the Primary D-Channel Board setting where appropriate.

Interface Number—If you select any item except non-member for the NFAS membership mode, you must enter the CO-supplied group interface number for each board in a NFAS membership group

NFAS Group Members—If the board that you are programming, is the controlling board in a NFAS group, use this feature to designate the controlled NFAS members in the group. The list can include up to four controlled members but must not include the primary or controlling board.

NOTE: When you are using Visual Man-Machine Interface (VMMI) to program, select NFAS Group Members from a list of NFAS boards that are not assigned to any other group.

To understand how to program a NFAS group list, consider the example that follows below.

Assume the following parameters:

- **a CO has a DMS 100 switch that provides your system with five T1 circuits configured for NFAS service,**
- **the CO representatives identify each circuit and specify interface numbers as 0 through 4 with interface number 0 providing the D-channel for signalling,**
- **you've connected the T1/PRI circuits to boards five through nine in ascending slot order,**
- **the system requires station level calling party identification and that the main number is 804–555–1234.**

For these parameters, you must program the boards to match the chart detailed below.

Logical Board Number	5	6	7	8	9
Board Type	DXPT1–PRI	DXPT1–NFAS	DXPT1–NFAS	DXPT1–NFAS	DXPT1–NFAS
Protocol	DMS 100				
Default Number	8045551234				
Calling Number ID Mode	Station Number				
NFAS Membership Mode	Primary				
Primary D-Channel Board	5	5	5	5	5
Interface Number	0	1	2	3	4
NFAS Group Members	6, 7, 8, and 9				

Line Programming

Conditioning a line port as PRI B Channel.

When you plan for a line to provide ISDN–PRI service, you must program it to be a PRI B Channel line. The system automatically defaults to this programming setting for any lines that you assign to a T1/PRI board. With the line conditioned to be a PRI B Channel line, you must set the DID/DNIS parameters for the line.

Making The DID/DNIS Programming Choices

The common carrier supplies DNIS information as DTMF digits. When the DNIS feature is combined with the Automatic Number identification (ANI) feature, the common carrier delimits the ANI information from the DNIS routing information with the asterisk (*) tone so that the system can process each portion properly.

The system uses information that you program in the DID/DNIS translation table to route the call to the proper intercom number. The system also sends the called number information to the SMDR/SMDA line report and makes the information available to devices that are connected to the Open Architecture Interface (OAI).

As a single service, if the call routes to an LCD speakerphone, the speakerphone's display shows the name that you programmed in the DID/DNIS translation table. If you have programmed no name there, the display shows the DNIS/DID block name that you assigned to the DID/DNIS block. If you have programmed no name there, the display shows the processed DNIS digits. (As a DNIS/ANI combined service, the display shows the processed ANI digits.)

DID/DNIS Block Name—Choose a 7-character name to associate with each DID/DNIS block. End the DID/DNIS block name with a space if you desire a blank space between the name and the CO digits when they show on an LCD speakerphone's display. Also, the number of CO digits that will show in the display is dependent on the length of the DID/DNIS block name.
End the DID/DNIS block name with a space if you desire a blank space between the name and the CO digits when they show on an LCD speakerphone's display. Also, the number of CO digits that will show in the display is dependent on the length of the DID/DNIS block name.

Expected CO Digits—Type quantity (0–7) of digits and press ENTER.
Obtain a block of numbers for use from the CO. The system supports a maximum of 400 numbers (for example, 555–1000 through 555–1399). You can have a maximum of four DID blocks with each DID block using its own name, signalling protocol, digit addressing method and number of digits needed to avoid numbering conflicts. As a default, the system assigns all DID lines to block one. A DID block represents a group of lines that the system will use to receive calls for one or more CO directory number blocks.
You will derive maximum user convenience if you choose the CO block to match the intercom numbers that you have assigned to the system. (For example, if your intercom numbers are 1000 - 1399, they would match the sample CO block.)
Determine the quantity of unique digits in the string that you expect to receive from the CO. The number of digits expected should be large enough to avoid numbering conflicts within a DID block and provide future growth. In the case of the CO block mentioned above, the quantity of unique digits is three, which covers 1000 through 1399. If the CO block was 555–1100 through 555–1192, the string quantity would be two, which covers 00 through 480.

ANI Delivery—Press SPACE bar for Yes or No and press ENTER.
Enable or disable the system to process ANI information that is delivered by the long distance common carrier as a T1 feature on dial 800 and dial 900 lines.

Information Digits—This option does not apply to T1/PRI. Be sure it remains disabled.

DISA Voice Options—Type DVA message identification number (1–4) and press ENTER.
Use the DISA Voice Options 1 through 4 to select digital voice announce (DVA) message levels. For example, selecting DISA voice option 2 will cause welcome greeting 2, day main menu 2, night main menu 2, recall no answer 2, and recall busy 2 prompts to play whenever a DISA-configured DID line is covered by DVA.

Alternate Routing—Type intercom number (up to four digits) for station to handle misdialed calls.
Use this procedure to select an attendant station to serve as an alternate routing station. The system will route DID calls to this station if it cannot find the digits it receives from the CO in the translation table. The system will ring this station with a distinctive ring tone or pattern that you program. If you do not select an attendant station with this procedure, the system routes the call to the dial 0 station. If the dial 0 station is not available, the system returns a reorder tone to the caller.

Ring Code—Type code (1–8) to specify the ringing pattern for calls to the alternate station.

CFOS Enable—Press SPACE bar for choice and press ENTER.
Use this selection to enable Call Forward Outside System for this DID line block. CFOS allows the system to forward incoming or transferred line calls to telephone numbers that are outside the system.

NOTE: If you save the changes and you have changed the expected digits value, additional prompts may appear.

Configuring The DID/DNIS Translation Tables

When you initialize a translation table, you must first enter the string of CO digits that you obtain from the telephone company. Then you must enter the intercom number that you want to match with the first CO digit sequence in the string. With this, the system automatically matches the remainder of the CO digit string to consecutive intercom numbers beginning with the one that you entered. You can edit the translation table by selecting the item number for each entry and making the changes that you deem necessary. The translation table includes the following listed items:

CO Digit String: This is the actual string of digits expected from the CO. Within a table, each CO digit sequence in the string must be unique. While each CO digit sequence must have an assigned extension number, you can assign the same extension number to several CO digit sequences if you wish.

Name: As an option, you can enter a seven character name for each CO digit sequence in the string. If you assign a name, the system will use it for LCD display during signalling.

Day Number: This personal or group intercom number is the one that the system will ring when a DID/DNIS call arrives through the matching CO digit sequence during normal or daytime operations. DID/DNIS **will not** support Delay Ring, Day 1 ring, or Day 2 ring modes.

Night Number: As an option, you can assign a personal or group intercom number that the system can ring when a DID/DNIS call arrives through the matching CO digit sequence during night transfer (of ringing) operations.

Ring Code: As an option you can choose one of eight distinctive ringing codes for each CO digit sequence in the string. Remember, the proprietary analog telephones provide only four distinctive ring possibilities.

Line Group Programming *(For ISDN–PRI Service)*

When you provide ISDN–PRI service to system stations through a T1/PRI connection to the central office (CO), you should do so through line group access rather than individual line connections. Remember, one T1/PRI connection to the system yields 23 channels for communications to and from the stations (24 channels for DXPT1–NFAS boards). While these channels correspond to line ports within the system, line designations such as Line 1, Line 2 and so forth are meaningless for the T1 board's CO connection designation. When the T1/PRI board is called upon to pass an incoming or outgoing call between a station and the CO, it can do so through any of the available channels. Having the system choose the channel is the most efficient method for call completion. To best effect this, program the line ports that correspond to the 23 voice channels (plus 24 voice channels for each DXPT1–NFAS board controlled by the D channel) into one line group, and assign that line group to the stations that are to have ISDN–PRI service.

During operation, the system searches for an idle line in the line group in the same order that you program them using this procedure.

Station Programming

In addition to the many other features that you can assign to a station, there are several features that are specific to ISDN–PRI service.

Signal Type

The Signal Type feature selects the information transfer capability that the system requests during call setup for a specific station port. The signal types that you can select include the following items:

Speech—digitized speech only–allows analog transmission, echo cancellation, and time-assigned speech interpolation, (suitable for speech only)

3.1 Khz Audio—3.1 Khz digitized audio–allows analog transmission but does not allow speech processing (suitable for modems),

56 Kbps Digital—56 Kbps digital data rate adapted to 64 Kbps (future feature),

Restricted Digital—64 Kbps digital data that is restricted so that there is no 8-bit zero pattern allowed in any time slot (future feature),

Unrestricted Digital—64 Kbps digital data with no restriction on bit pattern (future feature).

Outbound Calling Number ID

The Outbound Calling Number ID feature allows you to choose the caller ID number that will identify the calling station to a distant party. Usually you should set this feature if you specify station level identification as the *Calling Number ID Mode* in *Board Configuration Programming* unless you want the default number to go out instead (for example, for a shared telephone in a common area).

Station ID (future feature)

The system can transmit a Station ID using ISDN display and/or sub-address messages. The system transmits the station ID when you choose either *station number* or *default with station ID* in *Board Configuration Programming*. This feature, when supported by the central office equipment, includes a station's full name or extension number as additional caller ID information. You can choose three different ID types:

None—no station ID information supplied for this station,

Extension—station's extension number supplied as a sub-address,

Full Name—station's full name field supplied as a sub-address.

Button Mapping

When you assign station level *outbound calling number ID* to a station through *Station Programming*, it is a good practice to also map a RESTR (restrict) button on the station. By pressing the **RESTR** button, the station user can block the outbound calling number ID whenever needed. Once enabled, the restriction remains in effect until you deactivate it.
Remember, you can assign feature functions at a first level or at a second level at each button. If a function requires status light feedback, assign that function to the first level because the system does not provide status light feedback to buttons at the second level (press CONTROL N to display the second level).

Feature Numbering

Dialing codes for user features are flexible so that you can renumber them. This may be necessary if site requirements dictate that personal or group intercom numbers fall within a certain block or sequence. Since new number assignments can not conflict with existing numbers, the system provides a block of unassigned numbers that you can use for renumbering. At default, the system assigns blocks of numbers in the following ranges:
101–292 = personal intercoms,
3101–3292, 4101–4292, 5000–5023 = group intercoms,
5024–5999 = unassigned,
600—899, T, # = feature codes
9 = line group 1

There are two features used with ISDN–PRI service that have no defaulted dialing code. Use this procedure to assign dialing codes to these following features:

Signal Type—By providing a dialing code, you provide users with the ability to select the station's signal type. For example, a modem might dial the feature code for 3.1 Khz audio prior to making a data call and then return the station to speech after the data call is complete.

Restrict Calling Number ID—By providing this code, you give users the ability to block outgoing Calling Number ID information. Even though they block the information with this code, the system still transmits the information but it tags it as restricted. This restriction tag prevents the called party from receiving the ID data unless they are an emergency services provider (such as 911) or are paying for the call (such as a 1–800 number provider). Once enabled, the restriction remains in effect until you deactivate it.

CAUTION

If a number conflict exists, the system will prompt you to remove the conflict. Before responding to this prompt with a y (yes), be sure that doing so will not disturb other programmed features that depend upon the removed extension number. It is possible to create a situation where you must make several renumbering changes to completely resolve a number conflict.

Understanding The T1/PRI Alarms And Indicators

Most of the T1 alarms and indicators (LEDs) are located on the front-edge panel of the T1/PRI board, while several are located on the front edge of the DXOPT-SYN card. The following sections discuss the alarms and indicators.

NOTE: Red /Yellow LEDs, when lit, indicate errors or non-standard configuration for normal operation.

T1/PRI Board Indicators

Red Alarm (red LED) When this LED indicator is lit, the system cannot establish communications with the network.

Yellow Alarm (yellow LED) The yellow alarm is lit whenever the far end has lost synchronization to its incoming signal. This alarm indicates a transmit problem..

Sync Alarm (red LED) This LED (labeled *SYNC LOSS*), when lit, indicates that the frame bit in the received data cannot be found. this alarm indicates a receive problem.

Signal Alarm (red LED) The signal alarm (labeled *SIG LOSS*) turns on to indicate that the DXP *Plus* has lost its incoming signal. This alarm indicates a receive problem.

Blue Alarm (red LED) When this alarm indicator is lit, the alarm indication signal (AIS) consisting of all one (1) bits is being received to indicate that the far end has lost its received signal. The purpose of this signal is to maintain the system clocks during a link failure. This alarm indicates a transmit problem.

Bipolar Alarm (red LED) The system converts the digital bit stream in T1/PRI communications to a bipolar format through a process called alternate mark inversion (AMI). The voltage polarity of the ones pulses (marks) alternates between plus and minus with a zero (space) represented by no pulse. A bipolar violation occurs whenever two successive pulses are of the same polarity. This alarm LED indicates a bipolar violation (BPV) has occurred. It is important to note that BPV errors are not passed through regeneration points. This alarm indicates a receive problem.

Cyclic Redundancy Check (red LED) The cyclic redundancy check (CRC) indicator turns on whenever there is a discrepancy in the check sum received for an incoming frame from the originating system and the locally calculated check sum. This discrepancy indicates a data error in the received frame. The CRC is enabled by DIP switch SW2-4. This light indicates a receive problem.

Slip (red LED) This indicator is turned on whenever a frame slip is detected. This is caused by the transmit clock not being synchronized with the receive clock. This light indicates a synchronization problem.

Unlock (red LED) The transmit frequency (1.544 Mhz) is not locked with the receive clock when this indicator is lit.

B8ZS)/COFA (green LED) This is a dual-purpose indicator. Depending on how you set DIP switch SW2–6, this indicator reports either a change of frame alignment (COFA) at re-synchronization time (default setting) or bipolar 8-zero substitution (B8ZS) code words detected in the received data.

RLB, LLB, and PAYL (red LEDs) Whenever a loop back routine is active, either the remote loop back (RLB), local loop back (LLB), or payback loop back (PAYL) mode (selected by DIP switches SW2-7 and SW2-8) is indicated by the appropriate LED being lit.

DXOPT–SYN Board Indicators

PRI and SEC (green LEDs) The *PRI* and *SEC* LEDs on the DXOPT-SYN card light to indicate where the receive clock reference is originating from—the primary or secondary DXPT1 board location. When two or more DXPT1 boards are installed, you make the primary and secondary assignments via jumpers on the the DXAUX board. If only one DXPT1 board is installed, you can set the jumpers so that both LEDs will light.

UNLOCKED (red LED) When lit, the Unlocked LED indicates either that the straps on the Auxiliary board are set incorrectly, that the DXOPT-SYN card is defective, that the receive frequency is out of tolerance (1.544 Mhz ± 200 Hz), or that no valid ISDN–PRI line is connected..

MANUAL (red LED) This LED, when lit, indicates that the manual mode has been selected via the *AUTO/MANUAL* mode switch on the DXOPT-SYN card. When you select the manual mode (normally for maintenance/troubleshooting), you can select either the primary or secondary timing reference by setting the *PRI/SEC* switch on the DXOPT-SYN card. For normal operation, select the automatic mode. Do not manually force the clock reference to primary or secondary if the appropriate green LED is not lit. This will cause the VCO oscillator to default to its minimum or maximum tolerance, and the T1/PRI board(s) will not frequency-lock.

Viewing The Alarms And Indicators

T1PRI Board (in order from top to bottom)

LED*	Label	Error Or Status Condition When Led Is Lit
●	(Status)	Rapid flash = defective board Steady on = board in wrong slot or board constraints violated Off with repeated five second blink on = normal operation (T1 trunk idle) On with repeated five second blink off = normal operation (T1 trunk busy)
●	Red	Communications with network cannot be established (out-of-service)
⊙	Yellow	Network unable to frame sync to DXP
●	Sync	T1/PRI Board unable to frame sync to network
●	SIG	Loss of incoming signal
●	Blue	Alarm indication signal (AIS) being received (indicates loss of signal at far end)
●	Bipolar	Bipolar violation detected
●	CRC	Cyclic redundancy check error in incoming frame if SW2-4 is enabled
●	SLIP	Frame slip detected (check DXOPT–SYN settings)
●	Unlock	Transmit frequency (1.544 MHz) not locked with receive clock (check DXOPT–SYN settings)
○	B8ZS/COFA	B8ZS/COFA (B8ZS zero suppress mode/change of frame alignment) per SW2-6
●	RLB	Remote loop back active
●	LLB	Local loop back active
●	PAYL	Payload loop back active
○		Signalling message from DXP
○		Signalling message to DXP
○		Future feature–T1/PRI in network mode
○		Not currently defined
○		Not currently defined
○		On = D channel (layer 2) is down
○		D channel message to network
○		D channel message from network

NOTE: Diagnostic LEDs display PRI layer 2 (D channel) activity when you set the diagnostic switch to 00100000. Other switch settings cause factory test diagnostic codes to be displayed. Refer to the discussion titled, Configuring The T1/PRI board.

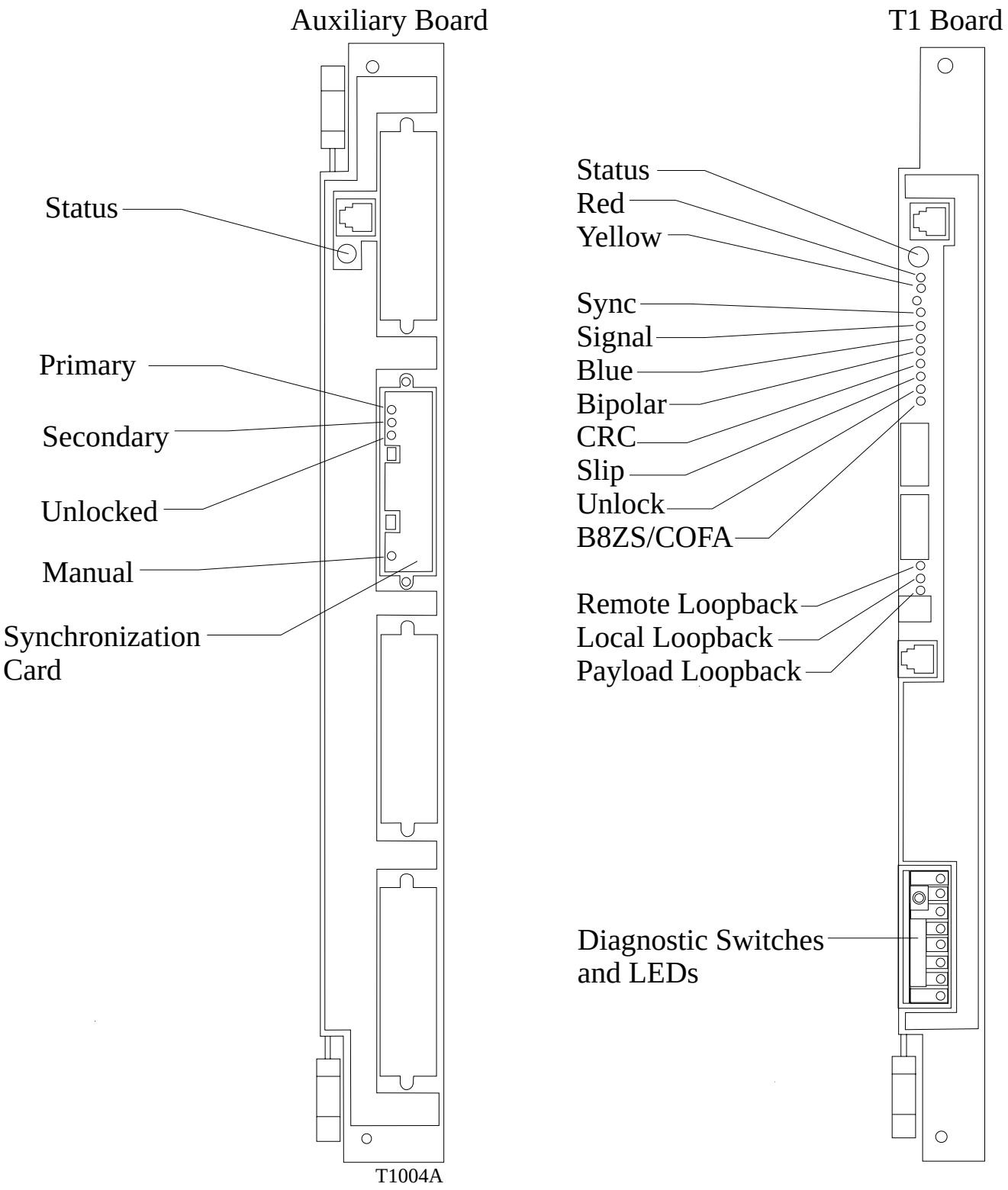
Synchronization Card

LED*	Label	Error Or Status Condition When Led Is Lit
○	PRI	Timing reference is present from the T1/PRI primary board
○	SEC	Timing reference is present from the T1/PRI secondary board
●	UNLOCKED	Trouble (defective DXOPT–SYN card or receive frequency out of tolerance (1.544 MHz ± 200 Hz)
●	MANUAL	The manual mode is active for selecting the T1/PRI reference

NOTE: *Red /Yellow LEDs, when lit, indicate errors or non-standard configuration for normal operation. Green LEDs indicate a normal condition.*

*LED color legend

● = Red ⊙ = Yellow ○ = Green



Viewing The Alarms And Indicators

Defining The T1/PRI Terms

Bipolar

A bipolar signal is composed of alternating pulses that both represent a digital logic 1. The positive pulse is a (+) and the negative pulse is a (-). Zero volts represents a space, or digital logic 0.

Bipolar Violation (or error)

A bipolar error is a digital logic 1 (or mark) that has the same polarity as its predecessor.

NOTE: Every time the system regenerates the signal stream, it corrects any bipolar errors; therefore, it prevents end-to-end error checking from using bipolar errors.

B8ZS (Binary Eight Zero Substitution)

This is a technique to send an all-zero channel without violating the ones-density requirement (a single one in each channel and no more than 15 zeros in a row). Voice transmission will not allow an all zero channel. The system accomplishes B8ZS suppression by inserting a special bipolar error that is interpreted, not as an error, but an all zero channel. The B8ZS feature replaces the all-zero channel two different ways. The feature replaces the all-zero channel with the sequence 000 + - 0 - + if the preceding pulse was a +, and the feature replaces the all-zero channel with the sequence 000 - + 0 + - if the preceding pulse was -. The + represents a positive pulse, the - represents a negative pulse, and 0 represents no pulse. The B8ZS feature is standard with ISDN–PRI service.

CAS (Channel Associated Signalling)

Channel Associated Signalling is a method of signalling where all signalling occurs on the channel being controlled. Examples of CAS are loop start and T1 lines.

CCS (Common Channel Signalling)

Common Channel Signalling is a method of signalling were all signalling for a group of channels occurs on one channel. ISDN is a CCS protocol.

COFA (Change of Frame Alignment)

When switch SW2-6 is off, the green LED on the DXPT1 indicates whether the network source or the network span caused the last frame synchronization. (This indication disregards the first re-sync at cold start or a system reset —cold start and reset causes the network source to re-sync.) A COFA occurs if the network source does a re-sync. The COFA is a diagnostic tool that identifies the source of the loss of frame synchronization.

CPE/Carrier Equipment

The DXPT1 is normally classified as Customer Premise Equipment (CPE). If you use SW2–2 to configure the DXPT1 board to use the internal CSU, the network may require that the system be classified as Carrier Equipment (CE). The information packet that the T1/PRI board sends to the network contains a facility data link (FDL) maintenance message that has a bit in it that provides this identification.

CRC (Cyclic Redundancy Check)

A method of checking errors from the transmission source to the destination. For T1/PRI operation, CRC calculates a checksum depending on the data in a frame. (You must enable CRC with DIP switch SW2-4).

DS-0 (Digital Signal-Level Zero)

Digital Signal-Level Zero is a single 64Kbit channel inside a T1/PRI span.

Extended Super-frame Mode (ESF)

Extended Super-frame Mode consists of 24 frames. The frame bit uses only 6 frames leaving 18 bits for other purposes. These spare 18 bits provide 6 bits for CRC information and 12 bits for a facility data link. The facility data link is for maintenance information (as defined by the ANSI T1.403 specification). Like the super-frame mode, the 64–Kbit user channels have 24 frames available for use. **ESF is standard with ISDN–PRI service**.

FDL (Facility Data Link)

The Facility Data Link is a 4–Kbit communication link from the network to the T1/PRI board. The system sends preemptive messages (for example, yellow alarm and loop back), if needed, and sends error packets to the network once a second. The packets contain alarm history in accordance with the ANSI T1.403 specification. FDL is standard with ISDN–PRI service.

In band Signalling

A signalling method where the system sends overhead signalling along with channel traffic.

Loop-back Local

An operation method that loops the T1/PRI board's transmit output and receive input paths. The loop back terminates all traffic and halts call processing. While in this idle condition, the system continues to transmit the T1/PRI transmit stream to the network but it will not answer incoming calls. If the remote T1/PRI equipment is the clock source (primary or secondary) for the DXOPT-SYN card, the remote equipment terminates the reference signal because the network receive circuit is open in local loop back. You initiate local loop back by setting the appropriate SW1 switches. The main purpose of local loop back is to verify the T1/PRI board's ability to synchronize properly.

Loop-back Payload

The loop back payload feature is an ESF method of loop back which loops the network receive input path to the remote T1/PRI equipment's transmit output path. This loop back method does not loop the first bit of each frame to allow the T1/PRI board's facility data link to continue to transmit maintenance information. You can use switches SW2–7 and SW2–8 to manually initiate the payload loop back or you can allow the network to send an FDL message to initiate or restore the payload loop back. The T1/PRI board goes out-of-service during the loop back time.

Loop-back Remote

The loop back remote feature loops the network receive input path to the remote T1/PRI equipment's transmit output path. The remote loop back feature terminates all traffic and halt any call processing. You can use the SW2 switches to manually initiate remote loop back or you can allow the network to remotely initiate the condition. The T1/PRI board's facility data link, or maintenance channel, can enable and disable remote loop back automatically or you can set SW2–7 on and SW2–8 off to manually enable remote loop back or set both switches off to manually disable the feature.

LIU Line Interface Unit

The line interface unit is the interface between the copper wires and the T1/PRI board's framing circuitry. The LIU is responsible for separating the 1.544MHZ receive clock from the incoming stream and converting bipolar Alternate Mark Inversion (AMI) to 5–volt digital logic. The LIU also supports the automatic line build-out that regulates the transmit level according to the receive strength (LIU-2 switch).

Primary Clock Reference

The straps on the DXSRV–PLS board designate the primary clock reference. Primary clock reference is the first choice reference clock used to synchronize the DXP to the incoming span. If the system looses synchronization, it uses its secondary clock reference. If the secondary clock reference is not available, the DXOPT-SYN card's variable clock oscillator (VCO) switches to the fixed oscillator on the DXSRV (services) board. When it does this, slips occur.

Repeater

A repeater is a amplifying device that central office technicians place at approximately one mile intervals along a T1/PRI circuit to boost the T1/PRI signal. The T1/PRI specifications allow a maximum of 50 repeaters along a communications path.

Slip

This term describes the condition that exists when the transmit 1.544 MHz clock is different from the receive 1.544 MHz clock. When the system collects or looses a frame of information due to the span frequencies being different, the system generates a slip error. Slip does not affect voice transmissions and may not affect modem traffic; however slip does effect digital data traffic. The T1/PRI board does not currently support digital data traffic. Also, at times a central office takes a T1/PRI span out of service if too many slips occur—one or two a day is permissible (the carrier supplier will furnish you with an an exact number if you request that information from them).

Knowing The T1/PRI Specifications

Capacity	6 T1/PRI boards
Modes	Extended super-frame
Framing	D4
Channels Allocated	24
Industry Standards	ANSI T1.403-1989 AT&T PUB 62411 CCITT 0.921 CCITT 0.931
Maximum Output	2.4V to 3.6V base to peak, short circuit protection to 120 mA, rms
Line Rate	1.544 Mbps
Line Code	
Type	Bipolar AMI
Zero Suppression	B8ZS
Receive Sensitivity	-26 dB or -36 dB selectable
Impedance	100 Ohms
DXP Loss Insertion	
Transmit	-6 dB (selectable to 0 and -3 dB per channel)
Receive	0 dB
Connector	RJ48C, miniature 8-position, shielded (per ANSI T1-403, 1989)
Cable	Up to 6,000 feet between DXPs, 22 AWG, twisted-pair, no external components
CSU Function	Built-in; CPE or CARRIER selectable
Transmit Attenuation	
Manual	0, -7.5, -15, or -22.5 dB selectable
Automatic	Default
Input Jitter Tolerance	138 UI @ 1 Hz; 0.4 UI @ 10 KHz—100 KHz (0 dB line); corner frequency = 6 Hz (attenuates 20 dB per decade above corner)
Surge Protection	1 AMP fuse and transient protection for metallic >6 volts P-P; Longitudinal (tip—ring and chassis ground) protection 1500 volts minimum.
Elastic Store	Two frames, no frame loss when slipping
Compliance	FCC Part 68/Doc FCC Part 15 UL-1489/CSA (safety) USOC = 6.0Y FIC = 04DU9–1SN
Yellow Alarm Type	Alternating bytes = all zeros and all ones; (prohibiting ANSI FDL messaging during yellow alarms is selectable)
Clocking	
Synchronization	Slave mode from DXOPT-SYN card on Auxiliary board
Min. RX Freq. Capture	1.544 MHz ± 200 Hz, T1 board; 16.384 MHz ± 2048 Hz, Sync card
TX Master Mode Freq.	1.544 MHz ± 75 Hz
Loop back Modes	
Extended Super-frame Mode	Local, remote, payload loop back (manual) FDL ANSI network remote loop back FDL ANSI network payload loop back
LED Alarms/Errors	Status Red Alarm Yellow Alarm Blue Alarm Loss of receive synchronization Loss of signal Bipolar error(s) CRC errors (ESF) Slip errors Phase Lock error

Up-Grading Your DXPT1 Board For ISDN–PRI Support

Up-grading existing revision B or later DXPT1 boards for ISDN–PRI service consists of adding a DXPRI card to the T1 board, and changing the board's chip firmware. When you do this, the T1 board/DXPRI card combination with the new firmware becomes a DXPT1–PRI board.

If you add the ISDN–PRI firmware to an existing T1 board but do not install the DXPRI card, you create a NFAS (Network Facility Associated Signalling) DXPT1–NFAS board. The NFAS boards are slaves to the master DXPT1–PRI board in multiboard installations.

Installing The DXPRI Card

1. Be sure you are standing on the conductive mat that you have placed in front of the cabinet area and grounded to a good earth ground. (The third wire ground of the AC power line is an acceptable grounding point if the AC wall jack is properly grounded.) The grounded conductive mat provides a safe static electric discharge path.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground.

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. Normally you should disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the digital communications system's main cabinet power supply; however, when necessary, you can remove a DXPT1 board from an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the pre-charge port on the power supply. During step 5, you will connect the other end of this coil cord to the pre-charge jack on the T1 board.
4. Loosen the retaining hardware and lift the front panel away from the common equipment cabinet.
5. Locate the DXPT1 board, and if you are removing the board from an operating system, connect the free end of the pre-charge cord that you installed in step 3 to the pre-charge jack on the line board.
6. Loosen any retaining hardware, use the extractor levers to disconnect the board from the connector on cabinet's backplane, and slide the board free of the board cage. If you connected a handset cord between the pre-charge port on DXP *Plus* power supply and the jack on board (as directed in step 4), disconnect it after removing the board.
7. Place the board in a static protection bag for safe keeping, and transport it to a static safe work area.
8. At the static safe work area, with your wrist strap in place, remove the DXPT1 board and the DXPRI card from their static protection bags.
7. Referring to the illustrations on the next page, orient the DXPT1 board and the DXPRI card, and attach them with the supplied hardware.

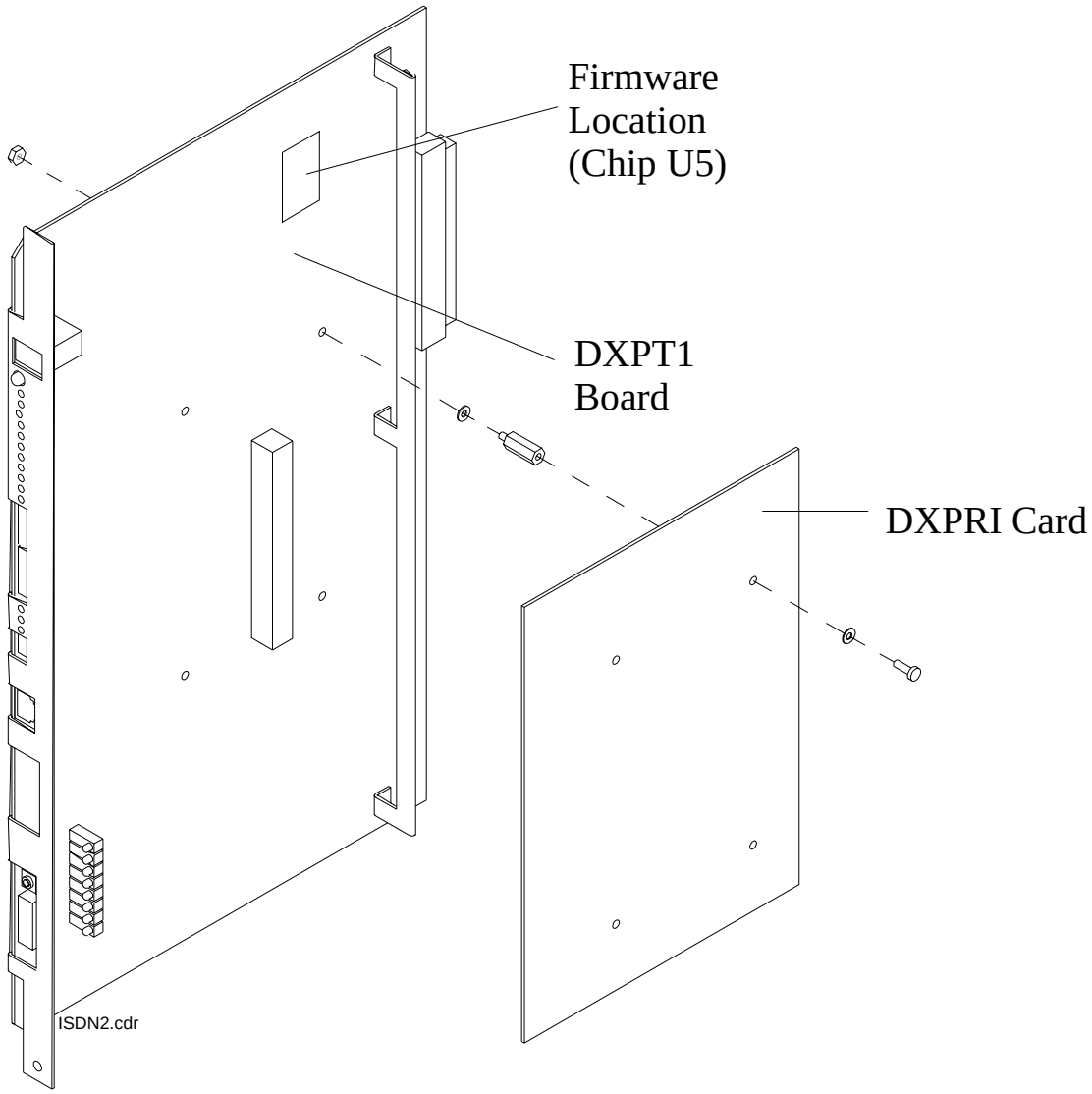
Replacing The Firmware

1. With the DXPT1 board still at your static-safe work area and with your static discharge wrist strap on your bare wrist and properly grounded, replace the chip-set firmware with the ISDN–PRI firmware (part number FW201–000).
2. Locate the current chip firmware (U5 at the upper rear of the board—see the illustration), and note its orientation in its socket.
3. Use a chip extraction tool to lift the chip free from its socket.
4. Remove the replacement chip from its static protection bag and orient it to match the orientation of the chip that you just removed.
5. Press the chip into place in the socket.

CAUTION

Do not bend any of the chip's pins so that they do not make contact with the socket.

6. Inspect the modified DXPT1 board for proper installation, and return it to its static protection bag.
7. Refer to the paragraph titled, *Installing The T1/PRI Line Board*, and re-install the modified DXPT1 board in the system.
8. Store your old firmware in a static-safe environment in the event that you may need it in the future.



Installing The DXPRI Card And ISDN–PRI Firmware

Understanding FCC Rules and Regulations

This electronic key system complies with Federal Communications Commission (FCC) Rules, Part 68. The FCC registration label on the DXP contains the FCC registration number, the ringer equivalence number, the model number, and the serial number or production date of the system.

Notification To Telephone Company

Unless a telephone operating company provides and installs the system, the telephone operating company which provides the lines must be notified before a connection is made to them. Provide the telephone company with the lines (telephone numbers) involved, the FCC registration number, the ringer equivalence number, the Facilities Interface Code (FIC), the Universal Service Ordering Code (USOC), and the USOC jack required. The FCC registration number and the ringer equivalence number is provided on the label attached to the common equipment. The FIC and USOC information is provided in the equipment's general specifications found in equipment system manual. The user/installer is required to notify the telephone company when final disconnection of this equipment from the telephone company line occurs.

Compatibility With Telephone Network

When necessary, the telephone operating company provides information on the maximum number of telephones or ringers that can be connected to one line, as well as any other applicable technical information. The telephone operating company can temporarily discontinue service and make changes which could affect the operation of this equipment. They must, however, provide adequate notice, in writing, of any future equipment changes that would make the system incompatible.

Installation Requirements

Connection of the electronic key system to the telephone lines must be through a universal service order code (USOC) outlet jack supplied by the telephone operating company. If the installation site does not have the proper outlet, ask the telephone company business office to install one. The correct outlet jack for this system is a type RJ48C.

Party Lines And Coin Lines

Local telephone company regulations may not permit connections to party lines and coin lines by anyone except the telephone operating company.

Troubleshooting

If a service problem occurs, first try to determine if the trouble is in the on-site system or in the telephone company equipment. Disconnect all equipment not owned by the telephone company.
If this corrects the problem, the faulty equipment must not be reconnected to the telephone line until the problem has been corrected. Any trouble that causes improper operation of the telephone network may require the telephone company to discontinue service to the trouble site after they notify the user of the reason.

Repair Authorization

FCC regulations do not permit repair of customer owned equipment by anyone except the manufacturer, their authorized agent, or others who might be authorized by the FCC. However, routine repairs can be made according to the maintenance instructions in this publication, provided that all FCC restrictions are obeyed.

Radio Frequency Interference

The electronic key system contains incidental radio frequency generating circuitry and, if not installed and used properly, may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference to radio and television reception; in which case the user is encouraged to take whatever measures may be required to correct the interference. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient the television or radio's receiving antenna, and/or relocate the DXP, the individual telephone stations, and the radio or TV with respect to each other. If necessary, the user should consult the manufacturer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the Government Printing Office, Washington D.C. 20402. Stock No. 004-000-00345-4.

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
This digital apparatus does not exceed the (Class A) limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.
Le pre'sent appareil nume'rique n'emet pes de bruits radioe'lectriques de'passant les limites applicables aux appareils nume'riques (de la class A) prescrites dans le Re'glement sur le brouillage radioe'lectrique e'dicte' par le ministe're des Communications du Canada.

CAUTION

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

COMDIAL®

Installing The Expanded Memory Card And Software Upgrade Card On The DXP Digital Communications System

This publication provides instructions for installing both an expansion memory card (DXRAM-EXP68K) and a software memory card (DXPSW-xxxx or DXPSW-xxx68K) on the central processor unit (DXCPU-68K) circuit board of the DXP digital communications system. The DXRAM-EXP68K provides expanded memory capacity for systems that store a large quantity of station message detailed accounting records. It replaces the DXRAM-STD68K standard memory card normally installed. The software memory card provides the operating system software data for the DXP. Whenever Comdial releases a software upgrade for the DXP, it releases it as a revision of the DXPSW-xxxx or DXPSW-xxx68K card.

When you install a new memory card or upgrade the system software, follow the sequence presented in this publication.

1.0 Prepare a static-safe work area.

2.0 Save the system database.

3.0 Install the memory card or upgrade the software on the memory card.

4.0 Master clear the system.

5.0 Restore the system database.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

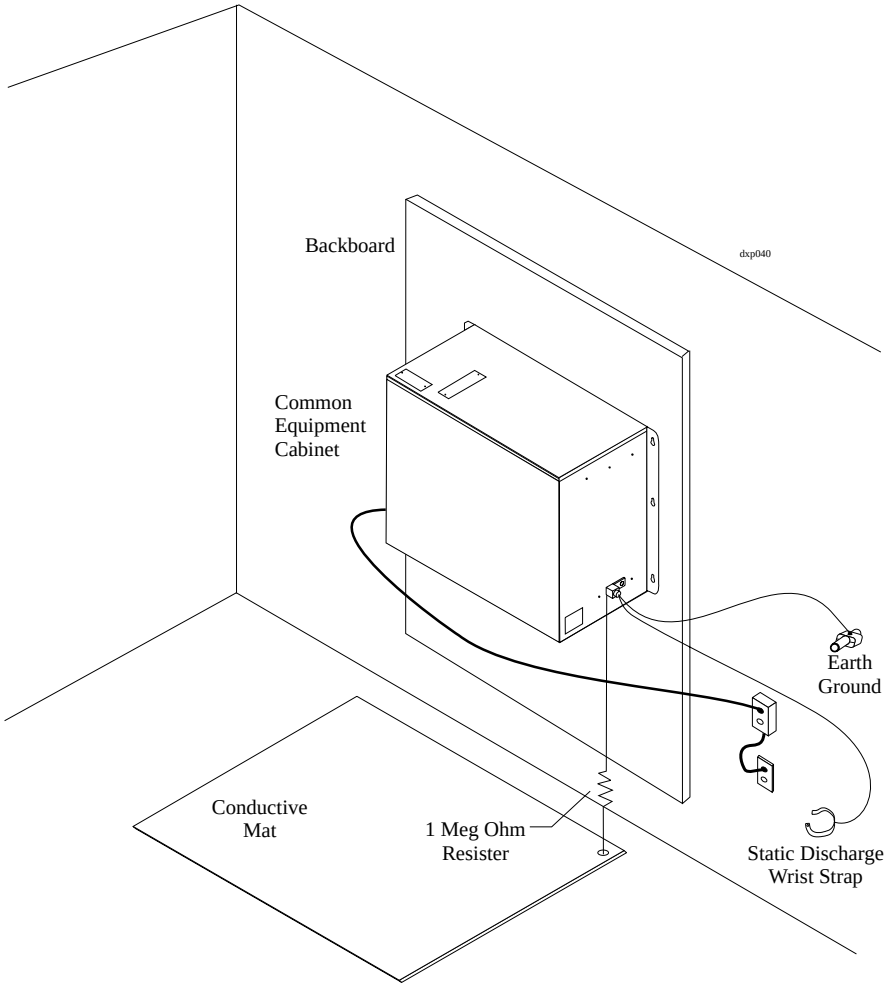
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1.0 Prepare A Static-Safe Work Area.

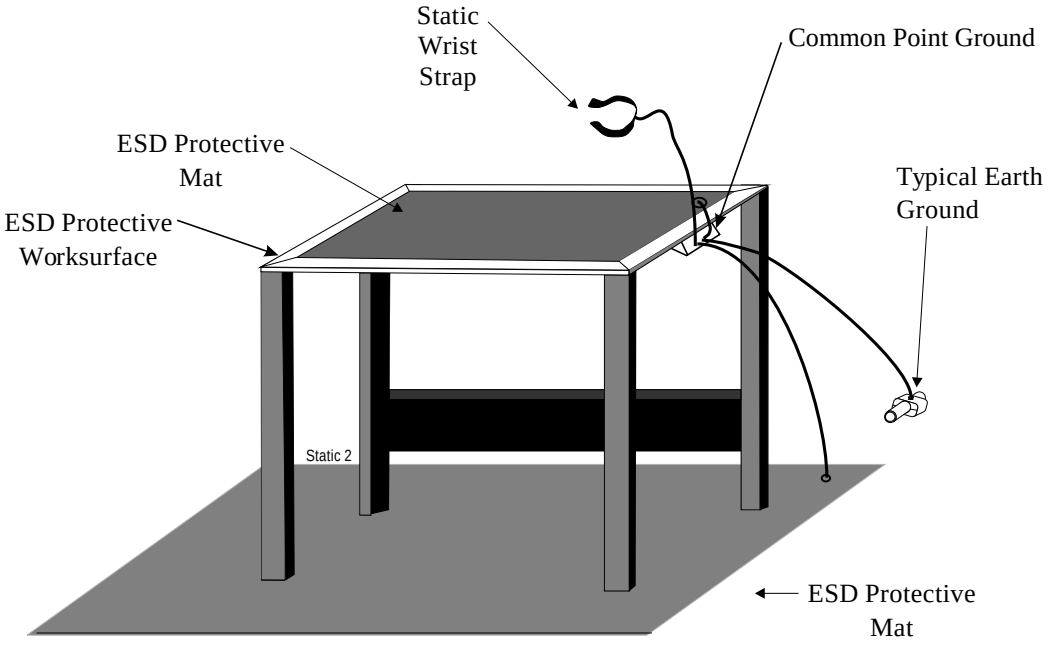
CAUTION

Electronic circuit boards are susceptible to damage caused by electrostatic discharge and must be handled accordingly. Refer to the Comdial publication IMI01-005, ***Handling Of Electrostatically Sensitive Components,*** *for general information. Specific handling precautions are also included in this installation instruction. The expanded memory card (DXRAM-EXP68K) and the system software memory card (DXPSW-xxx68K) are supplied in static protection bags. Do not open a static protection bag prior to installation time.*

When servicing electronic circuit boards, it is a good practice to do so at a static-safe work area prepared ahead of time for this purpose. The illustration details a typical static-safe work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

2.0 Save The System Database

2.1 Saving The Database Externally

Use this feature to save the system database externally from the DXP before you install a memory card and upgrade the software. Employ a personal computer with an XMODEM communications program to store the database on a magnetic diskette. The saved database can include any or all of the following data: system information, station parameters, line parameters, toll restriction and automatic route selection parameters, and system speed dial numbers but it does not include the SMDA/SMDR records. If you need these SMDA/SMDR records, you must make a printout of them before you perform the database storage. This is necessary because this save/restore feature does not record the stored records and they will be lost.

NOTE: This programming procedure details steps that you would follow when using the communications software program known as PROCOMM (produced by Datastorm Technologies). If you are using a different communications software, your steps may be different.

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select save/restore database menu and press ENTER.
4. From save/restore database menu, type item number for database parameter you wish to save and press ENTER.
5. Press SPACE BAR to select option (YES = save the database, NO = do not save the database), and press ENTER to accept selection and place cursor at next database parameter. Repeat step 5 for each database parameter that you wish to save.

   CAUTION

   You must select YES, to save the data. If you select NO, the data will be lost.
6. Press ESCAPE twice.
7. To save the database,
   (a) type *t* (transmit) and press ENTER,
   (b) press page-down button on the VDT keyboard,
   (c) type prompted number to choose XMODEM protocol,
   (d) type name of file where database is to be stored, and press ENTER. Database save is automatic.
8. To quit, type *q* and press ENTER.

2.2 Saving The Database Internally

Use this feature to save a database internally within the memory of the DXP before you upgrade the software.

NOTE: Do not use this method if you are installing a new memory card as well as upgrading the software.

Saving the database in this manner eliminates the need for a personal computer with an XMODEM communications program to translate the database between software upgrades. The saved database includes all of the following data: system information, station parameters, line parameters, toll restriction and automatic route selection parameters, and system speed dial numbers but it does not include the SMDA/SMDR records. If you need these SMDA/SMDR records, you must make a printout of them before you can perform the database storage.

CAUTION

For this procedure to work properly, the system must include the expanded memory card (DXRAM-EXP68K). If the system has the standard memory card (DXRAM-STD68K), you should use external save procedure

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select default and press ENTER.
4. From default menu, select on-board software upgrade and press ENTER.
5. Type y for yes to respond to prompt concerning SMDA/SMDR records. The system will save its database for later restore. The system will then prompt you to turn off the AC power and change the software.

3.0 Install The Memory Card And Upgrade The Software

1. Loosen the retaining hardware and remove the front panel from the DXP main cabinet.
2. Turn off the AC power switch, and disconnect the AC power cord from the AC outlet. Disconnect the cable of the optional battery back-up from the main cabinet power supply.
3. Place a conductive mat in front of the cabinet area and ground the mat to a good earth ground (the third wire ground of the AC power line is an acceptable grounding point). The grounded conductive mat will provide a safe static electric discharge path.
4. Install the static discharge wrist strap (supplied with the main cabinet) on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground.

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

5. Locate the DXCPU-68K circuit board, loosen the retaining screws, remove it from the DXP main cabinet, place it in a static protection bag, and transport it to the static-safe work area.
6. At the static-safe work area, with your wrist strap in place, remove the DXCPU-68K circuit board, the new DXRAM-EXP68K expansion memory card and the new DXPSW-xxxx or DXPSW-xxx68K card software memory card from their static protection bags.
7. Refer to illustration and remove the currently installed memory cards from the DXCPU-68K board.

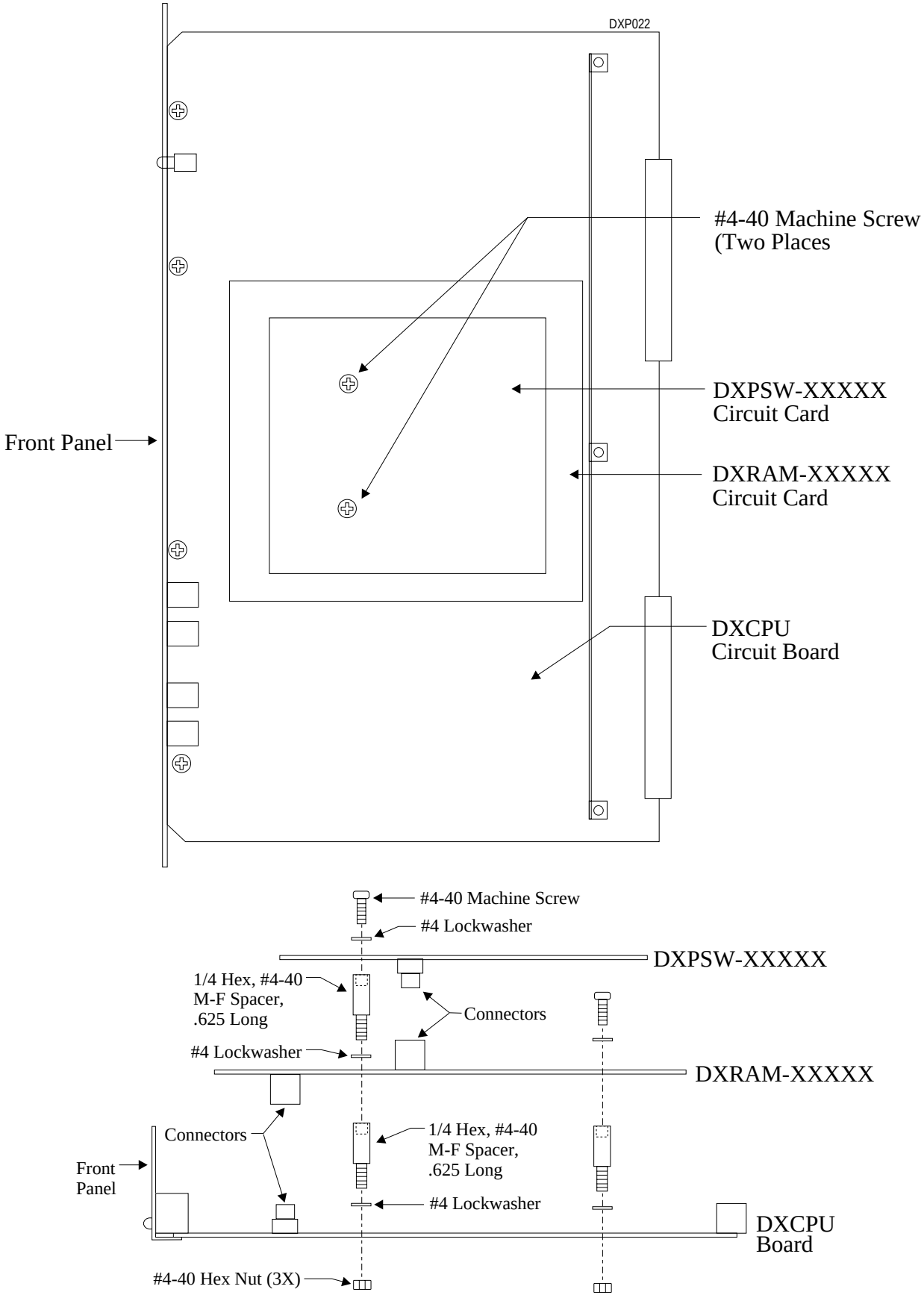
NOTE: Do not remove the currently installed DXRAM-STD68K standard memory card or DXRAM-EXP68K expanded memory card unless you are replacing it with a new one.

8. Orient the DXCPU-68K board and the new memory cards as shown in the illustration, and attach them with the supplied hardware.
9. Place the old memory cards in static protection bags and store them as back-up replacements. Place the DXCPU-68K board and newly installed memory cards into a static protection bag and transport back to the DXP main cabinet.
10. With your wrist strap properly grounded, remove the DXCPU-68K circuit board from the static protection bag. Orient it with the top and bottom guides in the main cabinet board cage, and press it in firmly until the board edge connector properly mates with the backplane connector.

CAUTION

When pressing the DXCPU-68K board into place, press it only at the extractor lever locations. If you apply pressure at other locations, you may damage the board assembly.

11. Make a final inspection to ensure that the DXCPU-68K circuit board is in the correct slot, oriented correctly and mated properly; then install and tighten the supplied screws to secure it to the board cage.



Installing The Memory Card

4.0 Master Clear The System

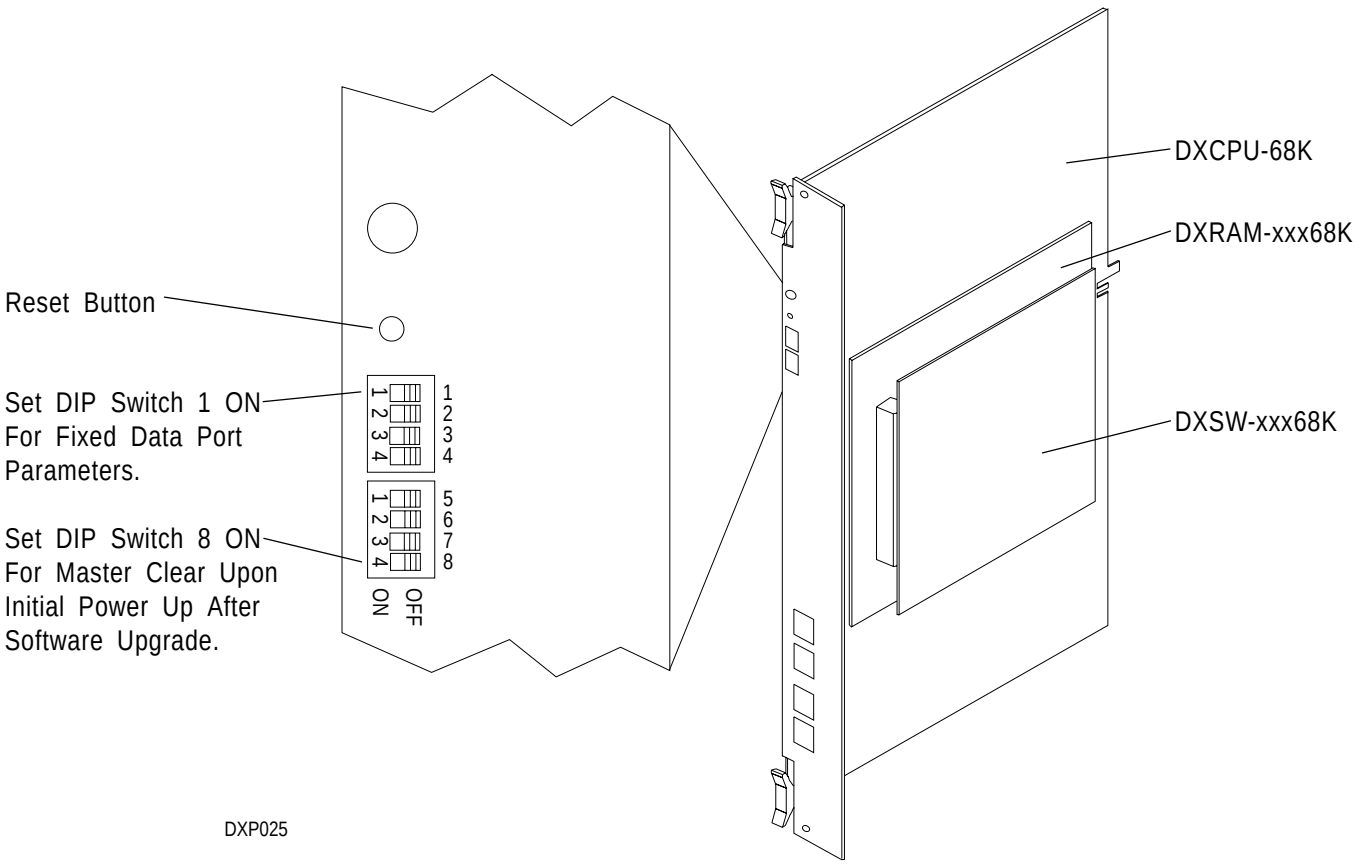
If you do not master clear the system, it is possible the DXP will not perform properly with the new memory card. The DXCPU-68K board provides a method for the master clear to occur automatically at the initial power up after you have changed or upgraded the software card. When you perform an upgrade, you must execute the following sequence of events exactly as they are stated here:

1. On the DXPCPU-68K circuit board, set DIP switch 8 to its ON position. This step enables the DXP to perform the master clear and is a required step; otherwise, the software upgrade will not occur and the system will not operate.
2. Connect the AC power cord to the AC outlet and turn on the ACpower switch. At power up, the DXP automatically executes a master clear operation. Observe that the LED indicators on the DXCPU-68K board, the DXSRV services board, and all installed station and line boards flash in a random pattern during the master clear sequence. After the master clear sequence is complete, the indicators on the DXCPU-68K and DXSRV boards turn on steady and the indicators on the station and line boards wink ON for four seconds and OFF for four seconds.
3. After power up, set DIP switch 8 to its OFF position.
4. Press the RESET button on the CPU board to reset the system.

NOTE: The system performs the automatic master clear one time following the initial power up after you have up-graded the software. It will not perform an automatic master clear operation again after subsequent power ups. Because of this, you can leave DIP switch 8 ON if you wish. Leaving it ON will ensure that the DXP will always power up in a master cleared and operational mode after you have performed a software upgrade. However, by turning DIP switch 8 OFF, you prevent the DXP from becoming operational at power up after you have performed a software upgrade. This is good because, should you forget to save your database, it gives you an opportunity to reconsider your actions before the DXP erases the current database.

5. Replace the front panel on the DXP main cabinet.
6. Use the procedure titled Restore The Database to restore the externally saved database.

NOTE: The system will automatically reload the internally saved database into the upgraded operating software and then log out of the programming mode. The system takes an additional two to three minutes to power up after it receives AC power because of the time required for this database restoring process. You will observe random flashing indicators during the master clear sequence.



Locating DIP Switch 8 And The Reset Button

5.0 Restore The Database

5.1 Restoring The Externally Saved Database

Employ a personal computer with an XMODEM communications program to restore the database that you previously recorded on a magnetic diskette using the Save The Database procedure.

NOTE: Remember, this programming procedure details steps that you would follow when using the communications software program known as PROCOMM (produced by Datastorm Technologies). If you are using a different communications software, your steps may be different.

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select save/restore database menu and press ENTER.
4. From save/restore database menu, type item number for database parameter you wish to save and press ENTER.
5. Press SPACE BAR to select option (YES = restore the database, NO = do not restore the database), and press ENTER to accept selection and place cursor at next database parameter. Repeat step 5 for each database parameter that you wish to restore.
6. Press ESCAPE twice.
7. To restore the database,
   (a) type r (receive) and press ENTER,
   (b) press page-up button,
   (c) type prompted number to choose XMODEM protocol,
   (d) type name of file where database is stored and press ENTER. Database restore is automatic.
8. Press the RESET button on the CPU board to reset the system.

5.2 Restoring The Internally Saved Database

After you upgrade the software, set DIP switch 8 on the DXPCPU-68K board to its ON position, and turn on the AC power to the system. The system will automatically perform the master clear operation and reload the internally saved database into the upgraded operating software. When it completes this task, it automatically logs out of the programming mode. After the system logs out of the programming mode, press the RESET button on the CPU board.

NOTE: The system takes an additional two to three minutes to power up after it receives AC power because of the time required for the database restoring process. You will observe random flashing indicators during the master clear and data base restoration sequence.

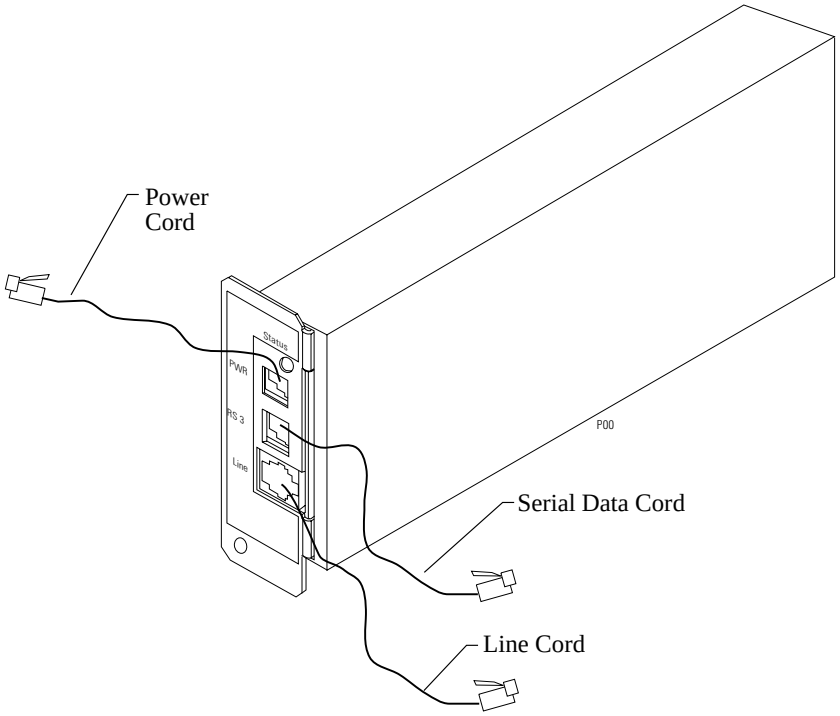
Installing And Programming The DXMDM Serial Data Modem

1.1 Understanding The Modem

The DXMDM modem allows remote servicing and programming of the DXP digital communications system. Software release 6.A supports operation with the DXMDM modem. The DXMDM is a general-purpose, Hayes*-compatible, serial data modem that receives its operating power and configuration programming from the DXP. The modem operating parameters are as detailed in the following chart.

Baud Out	Baud In	Data Bits	Stop Bits	Parity	Flow Control
2400	2400	8	1	None	None

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1.2 Installing The DXMDM Modem

The following procedure explains how to install the DXMDM modem. Figure 1 illustrates the relative position of the modem and the location of its connections. The modem fits in the bottom left corner of the DXP board cage just to the left of the services board (DXSRV) and directly below the interface board slot.

1. Locate DIP switch SW7 on the DXCPU board, and set it to its OFF position.
2. Insert the modem as illustrated in Figure 2. The modem rests on the bottom of the board cage.
3. Attach the modem to the cage with a single screw through the mounting-screw hole on the modem's front plate.
4. On the DXP power supply, located to the left of the modem, slide open the pre-charge port cover.
5. Connect the PWR cord from the modem to the pre-charge port, the modem's STAT light should turn on.
6. Connect the serial data cord from the DXMDM to the serial data port labeled RS232/2 located on the CPU board. This is the default port for the modem. When you use this connection, you will not need to take any programming action. Alternately, you can connect the DXMDM to one of the serial data ports provided by the DXP-COM card installed on the DXAUX board (if one is installed on your system). If you use a a serial data port other than the default port, you must assign it for modem operation using the programming procedure provided in Section 1.3.
7. Connect a telephone line into the modem's line jack.
8. Set DIP switch SW7 to its ON position to ensure continuous modem operation. This step is necessary because the DXMDM modem depends upon the DXP for both its power and configuration. With switch SW7 set ON, the system automatically matches the baud rate and serial data parameters of the modem regardless of which port you choose for modem connection.

CAUTION

If you disconnect the modem PWR cord from the DXP, you must reset the modem after you reconnect the PWR cord. Set switch SW7 to OFF, wait five seconds, and then return it to ON to reset the modem. (You can also reset the modem from the programming station. To do so, enter the system-manager programming mode and then dial 18#).

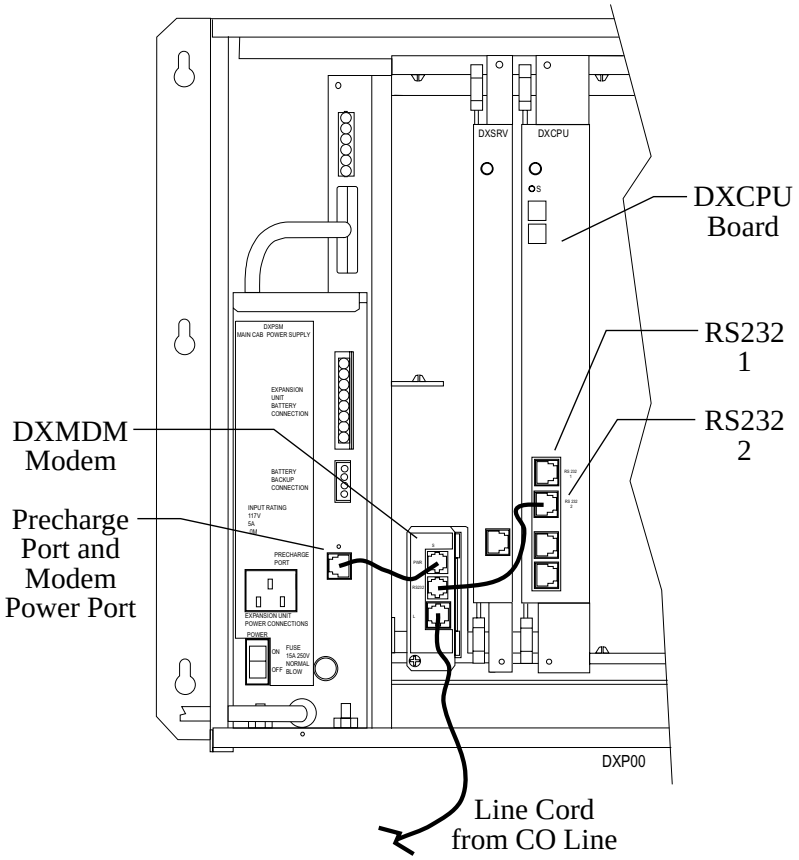


Figure 1. Viewing the Position of the Modem and the Location of Its Connections

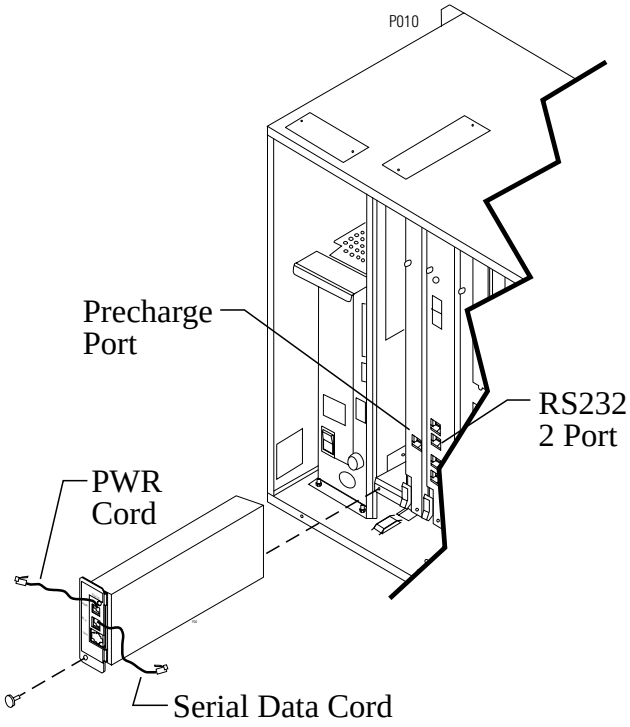


Figure 2. Installing the Modem in the DXP Main Cabinet

1.3 Selecting a Modem Port

If you connect the modem to a serial data port other than the default port, you must program the modem port number into the system database. Since the default port for both the modem and a SMDR printer is serial data port RS232 2 on the CPU board, it is good practice to choose a different modem port if the site employs both devices.

The following procedure explains how to program a new serial data port number into the system:

1. Set switch SW7 on the CPU board to its OFF setting.
2. From the VDT keyboard, type I✻746✻ and then press ENTER.
3. From main menu, select system and press ENTER.
4. From system menu, select serial ports and press ENTER.
5. From serial ports menu, select modem setup and press ENTER.
6. From modem setup menu, select port and press ENTER.

NOTE: You should never need to alter the modem's default initialize string that also appears on this screen; however, if you disturb the settings, you must return them to the following standard Hayes-compatible values: AT S0=1 M0 Q1 E0. The S0= value sets the rings-before-answer number (1= one ring, 2 = two rings, and so forth). You can set the S0= value to something other than 1 if necessary.*

7. Type the number for the modem port and press ENTER to accept setting.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Set switch SW7 to its ON setting.

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Comdial's Quality Management System Is Certified To The ISO 9001 Standard.

COMDIAL®

Installing A Dual Tone Multiple Frequency (DTMF) Receiver Card In The DXP Digital Communications System

1.0 Introducing The DTMF Receiver Card

The DXP digital communications system supports the use of on-premise industry-standard telephones.

To support the DTMF dialing of industry standard telephones, the DXP CPU board provides on-board DTMF receiver circuitry that supports simultaneous dialing of two industry-standard telephones at a time. This provision is adequate, if your site requires only a few industry-standard telephones; however. if you intend to support a population of industry-standard telephones that will generate a large volume of outgoing call traffic, you must install one or more DTMF receiver cards to provide additional DTMF receivers for the telephones. Each DTMF receiver card allows four industry-standard telephones to dial simultaneously. The number of cards that you need to install in the system depends upon how active the industry-standard telephones will be at the site. See Section 1.1 for details.

If you do need to add receiver cards, you add an auxiliary board to the system and install up to four DTMF receiver cards on it. The DXP system supports the use of two auxiliary boards installed at slots UNV1/AUX and UNV2/AUX in the main common equipment cabinet.

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1.2 Determining The Board Configuration That You Will Need

Use the following specifications to determine the maximum number of station boards and DTMF receiver cards that you may need.

- Each eight-station circuit board supports up to eight telephones. (It will actually support 16 telephones—two telephones at each port sharing a common intercom number.)
  - You can bridge up to two industry-standard telephones at one station port as long as you do not exceed a combined ringer equivalence number, or REN, of 2.0. (Remember, with two telephones at the same port, they share a common intercom number.)
- Each 16-station circuit board supports up to 16 telephones. (It will actually support 32 telephones—two telephones at each port sharing a common intercom number)
  - You can bridge up to two industry-standard telephones at one station port as long as you do not exceed a combined ringer equivalence number, or REN, of 2.0. (Remember, with two telephones at the same port, they share a common intercom number.)
- Each receiver card allows four industry-standard telephones to dial simultaneously. (The number of cards that you need to install in the system will depend upon how active the industry-standard telephones will be at the site.)
  - You can install four receiver cards on a auxiliary board. With four receiver cards installed, an auxiliary board supports simultaneous dialing of 16 industry-standard telephones (Remember, while you can install up to two auxiliary boards in the system, each auxiliary board that you use occupies a slot where you could install a station or line board.)

Based upon the above specifications, a fully-equipped DXP system provides the following industry-standard telephone support:

- a maximum of 352 industry-standard telephones (11 IST station boards times 16 telephones per board times two telephones per station port —sharing the same extension number) with a maximum of 18 telephones dialing simultaneously (four DTMF receiver cards times one auxiliary board times four DTMF receiver circuits per card plus the two DTMF receiver circuits that are always provided by the CPU board),
- a maximum of 320 industry-standard telephones (10 IST station boards times 16 telephones per board times two telephones per station port —sharing the same extension number) with a maximum of 34 telephones dialing simultaneously (eight DTMF receiver cards times two auxiliary boards plus the two CPU board supplied DTMF receiver circuits).

A typical telephone system, experiences the following call traffic percentages. Your system may be similar.

- Light Call Traffic = up to 15 percent of the telephones dial simultaneously
- Moderate Call Traffic = up to 20 percent of the telephones dial simultaneously
- Heavy Call Traffic = up to 30 percent of the telephones dial simultaneously

If you are not sure how many telephones will dial at the same time in your system, you can use these typical system averages and the following formula to arrive at a usable estimate.

(Percent Of Simultaneous Dialing) x (Installed IST Telephones) = (Simultaneous Dialing Telephones)

An an example the system maximum is as follows: .106 x 320 = 34 telephones

You can use the following formula to determine how many receiver cards that you must install in your system.

$$\frac{\text{(Simultaneous Dialing Telephones) – (2 Telephones Supported By CPU Board)}}{\text{(4 Telephones Supported Per Receiver Card)}} = \text{Total Number Of Receiver Cards}$$

As an example, the system maximum is as follows: (34 – 2) ÷ 4 = 8 cards

The following chart details typical hardware configurations for industry-standard telephone, auxiliary board, and receiver card usage.

Call Traffic	*Telephone Quantity*	*IST Board Quantity*	*Auxiliary Board Quantity*	*Receiver Card Quantity*	*Simultaneous Dialing*
Light	16	1	0*	0*	2
Moderate	16	1	0*	0*	2
Heavy	16	1	1	1	6
Light	32	2	1	1	6
Moderate	32	2	1	1	6
Heavy	32	2	1	2	10
Light	48	3	1	2	10
Moderate	48	3	1	2	10
Heavy	48	3	1	3	14
Light	64	4	1	3	14
Moderate	64	4	1	3	14
Heavy	64	4	1	4	18
Light	80	5	1	4	18
Moderate	80	5	1	4	18
Heavy	80	5	2	5	22
Light	96	6	2	5	22
Moderate	96	6	2	5	22
Heavy	96	6	2	6	26
Light	112	7	2	6	26
Moderate	112	7	2	7	26
Heavy	112	7	2	7	30
Light	128	8	2	7	30
Moderate	128	8	2	7	30
Heavy	128	8	2	8	30
Light	144	9	2	8	34
Moderate	144	9	2	8	34
Heavy	144	9	2	8	34
Light	160	10	2	8	34
Moderate	160	10	2	8	34
Heavy	160	10	2	8	34
Light	176	11	1	4	18
Moderate	176	11	1	4	18
Heavy	176	11	1	4	18

*The CPU board provides DTMF receivers that allow up to two industry-standard telephones to dial simultaneously.

1.3 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

2.0 Installing Circuit Boards

CAUTION

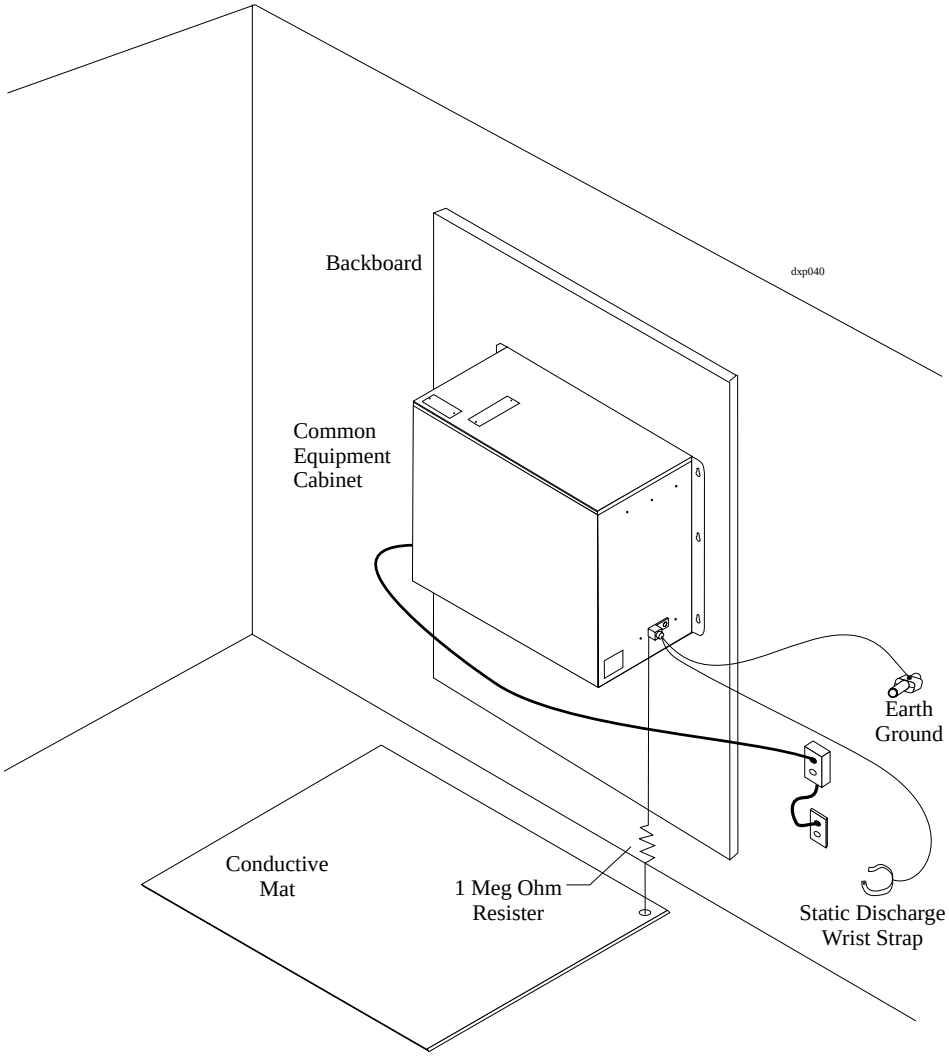
Circuit boards are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, for general information. Specific handling precautions are also included in this installation instruction.

2.1 Creating A Static Safe Work Area

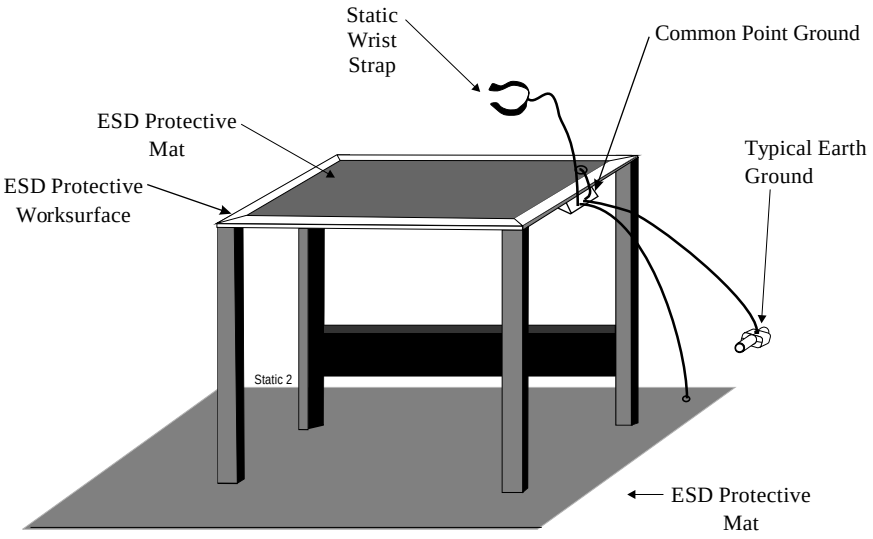
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

3.0 Installing The Receiver Card

You can install four receiver cards on an auxiliary board.

1. Be sure you are standing on the conductive mat that you have placed in front of the cabinet area and grounded to a good earth ground. (The third wire ground of the AC power line is an acceptable grounding point if the AC wall jack is properly grounded.) The grounded conductive mat provides a safe static electric discharge path.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground.

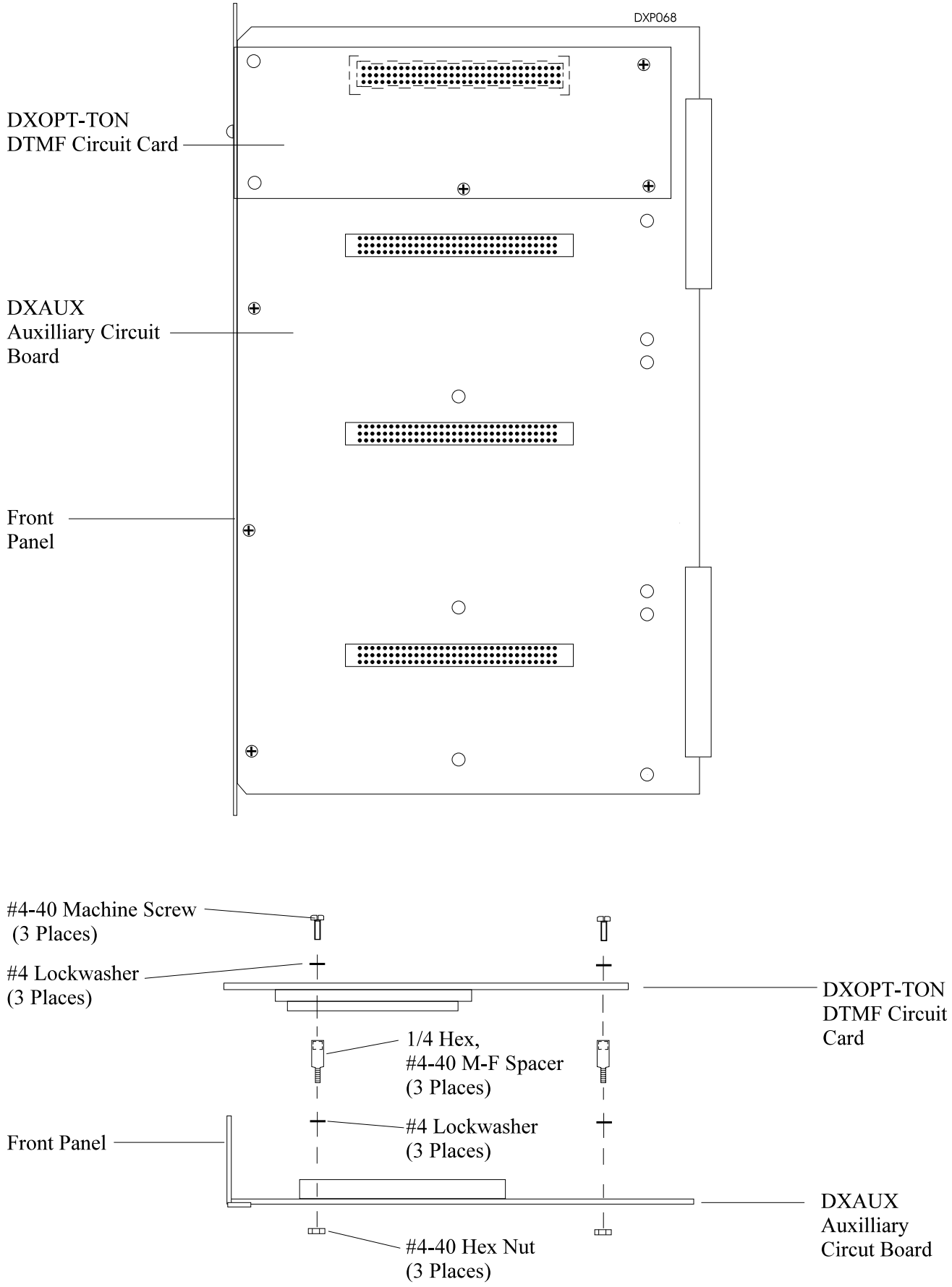
NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. Turn off the power to the system, unplug the AC line cord, and disconnect the optional battery back up equipment.
4. Loosen the retaining hardware, and lift the front panel away from the common equipment cabinet.
5. Loosen the retaining hardware and remove the auxiliary board from the cabinet, place it in a static protection bag, and transport the board to the static-safe work area. Do the same for the interface board if you plan to add a receiver card to it. Further, if the common equipment cabinet contains an auxiliary board and you plan to add the receiver card to it, follow the same procedure.
6. At the static safe work area, with your wrist strap in place, remove the circuit boards and receiver cards from their static protection bags.
7. Referring to the illustrations on the next page, orient the auxiliary board and the receiver card, and attach them with the supplied hardware.
8. Place the auxiliary board and the newly installed receiver card into a static protection bag and transport them back to the common equipment cabinet.
9. With your static strap on your wrist, remove the board assembly from the static protection bag and install the board assembly in either slot UNV1/AUX or UNV2/AUX in the main common equipment cabinet.

CAUTION

When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

9. Make a final inspection to ensure that the board assembly is oriented correctly and mated properly.
10. Install and tighten the supplied screws to secure the circuit board assembly to the board cage.
10. Plug the AC line cord into the AC outlet, reconnect any battery back up equipment, and turn on the switch on the power supply.
11. Replace the front panel on the common equipment cabinet.



Connecting The Receiver Card On The Auxiliary Board

COMDIAL®

Installing The Ring Generator Assembly In The DXP Digital Communications System

1.0 Introducing The Ring Generator Assembly Installation

The DXP digital communications system supports the use of on-premise industry-standard telephones. To do this, it requires a ring generator assembly to supply ringing voltage to the industry-standard telephones to signal incoming calls.

Regardless of the number of installed industry-standard telephones, you will need to install one ring generator in the main cabinet. You will also need to install one ring generator in the expansion cabinet if the site includes an expansion cabinet that contains IST station boards.

1.1 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

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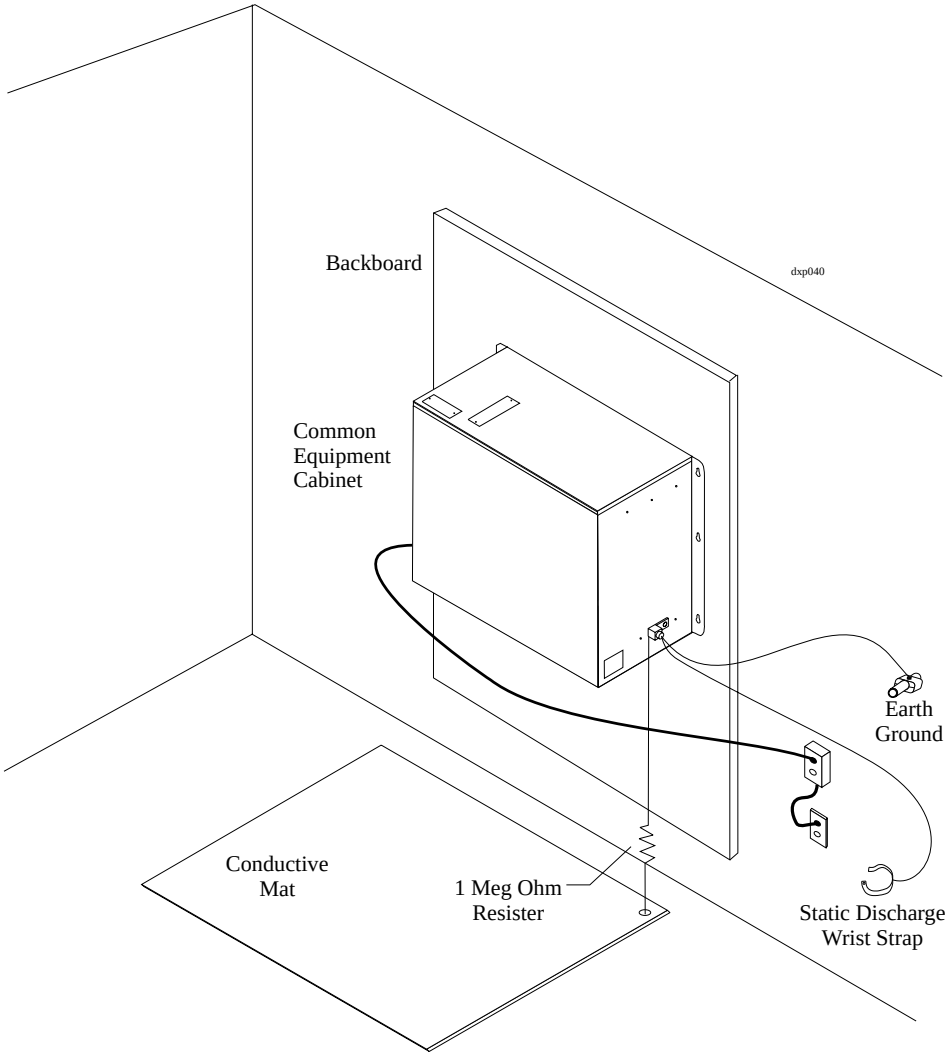
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2.0 Creating A Static Safe Work Area

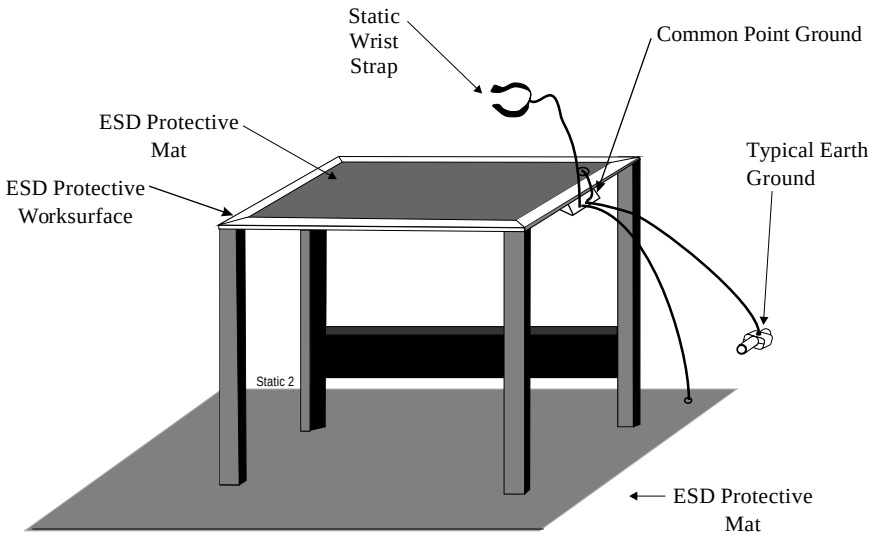
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

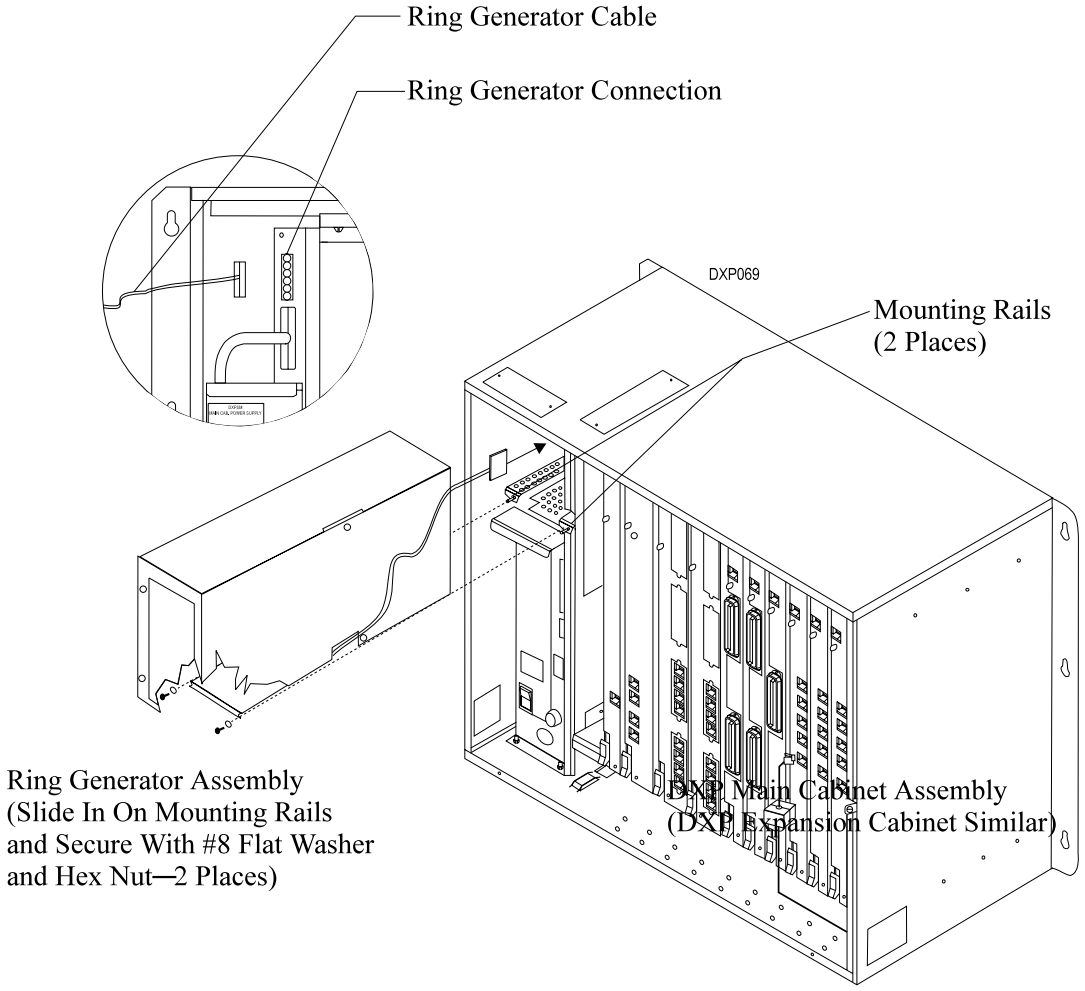
3.0 Installing The Ring Generator Assembly

You can install the ring generator assembly in the main and expansion cabinets per the following steps.

1. Turn off the power to the system, unplug the AC line cord from the AC outlet, and disconnect the optional battery back up equipment.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. Orient the ring generator assembly at the upper left of the common equipment cabinet just above the power supply assembly, and connect its cable connector to the DXP backplane connector
4. Slide the ring generator into the cabinet on the rails provided for this purpose and secure it in place with the supplied hardware.
5. Plug the AC line cord into the AC outlet, reconnect any battery back up equipment and turn on the switch on the power supply.
6. Replace the front panel on the common equipment cabinet.



Installing The Ring Generator

COMDIAL®

Installing The Conference Board In The DXP Digital Communications System

1.0 Introducing The Conferencing Board

The software timing for the DXP system, dedicates 26 time slots for conferencing operations. Different types of conferencing actions require different quantities of time slots as detailed in the following list:

- SOHVA = 2 time slots,
- Executive Override = 6 time slots,
- Four-Way Conference = 14 time slots,
- Service Observing = 2 time slots,
- Three-Way Conference = 6 time slots,
- Five-Way Conference = 22 time slots,

The maximum conference combinations that the system allows at any one time are as follows:

- one five-way plus two SOHVA,
- four three-way plus one SOHVA
- one four-way plus two three-way,

The optional conference board adds the capability for five additional three-way conferences. These are three-way conferences consisting of three stations or two stations and one line. These additional three-way conferences do not provide additional SOHVA or service observe capability.

When you install the conference board, the system uses its capacity of three-way conferences before using the main system resources for additional conferencing.

1.2 Complying With Underwriters Laboratories Regulations

Per The Underwriters Laboratories regulation 1459, 2nd edition, be aware of the following precautions when installing telephone equipment that is to be directly connected to the telephone company network:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

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2.0 Installing Circuit Boards

CAUTION

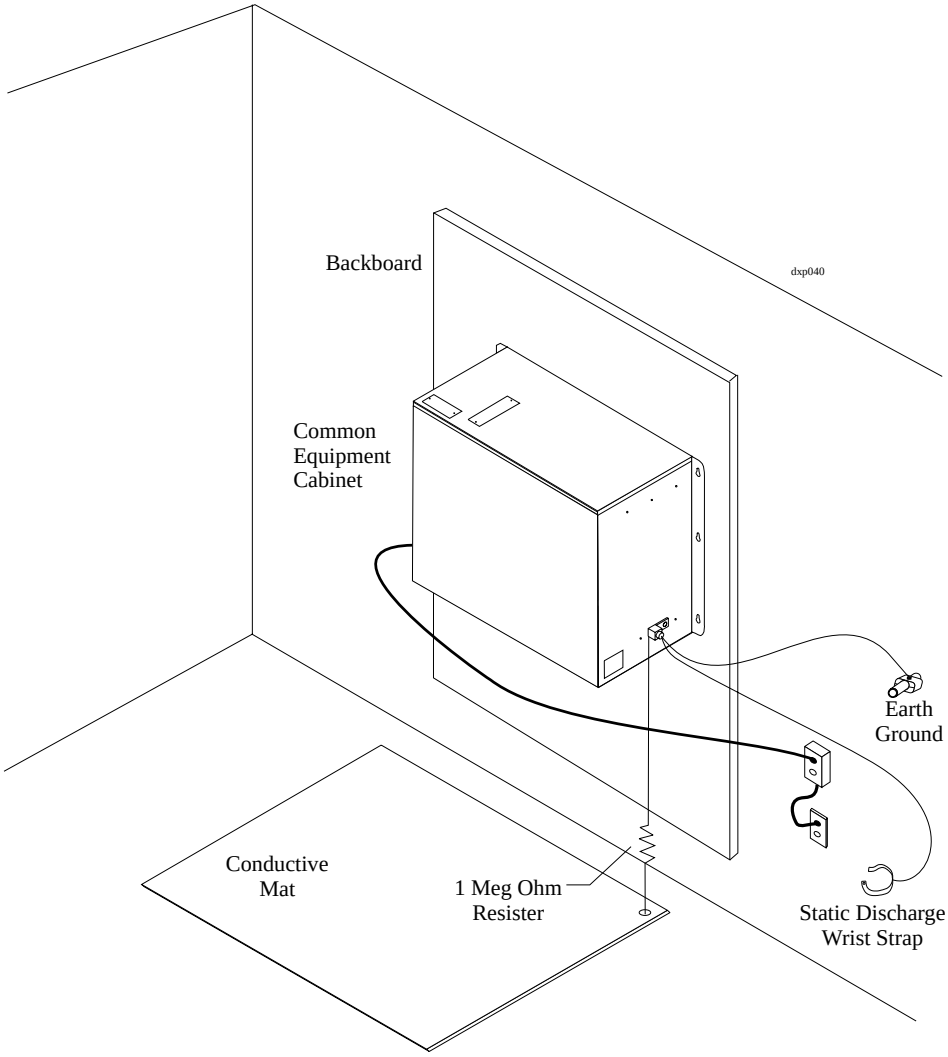
Circuit boards are susceptible to damage caused by electrostatic discharge, and you must keep this fact in mind as you handle the circuit boards. Refer to the Comdial publication IMI01-005, Handling Of Electrostatically Sensitive Components, for general information. Specific handling precautions are also included in this installation instruction.

2.1 Creating A Static Safe Work Area

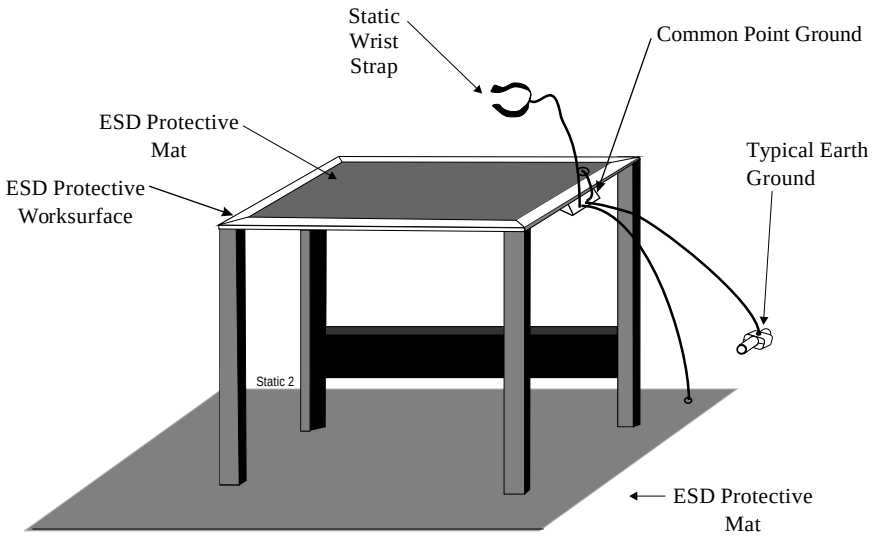
When servicing the common equipment cabinet at the installation location, it is a good practice to place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is also an acceptable grounding point.) The grounded conductive mat provides a safe static electric discharge path.

When removing the common equipment cabinet from the installation location for servicing, it is a good practice to prepare a static-safe work area on which to place the cabinet.

You should supply yourself with a static discharge wrist strap, and wear it every time you handle electronic circuit boards either at the cabinet mounting location or at your work area.



Providing Static Protection At The Cabinet Mounting Location



Creating A Static Safe Work Area

2.2 Installing Conference Boards In The Equipment Cabinet

Install one or more conference boards (as needed) in any unused universal board slots (UNV1/AUX, UNV2/AUX, UNV3–UNV5).

1. Normally you should disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply; however, when necessary, you can install a DXCNF board in an operating system. If you must do this, connect one end of a standard telephone handset coil cord to the precharge port on the power supply. During step 6, you will connect the other end of this coil cord to the precharge jack on the station board.
2. Install your static discharge wrist strap on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground

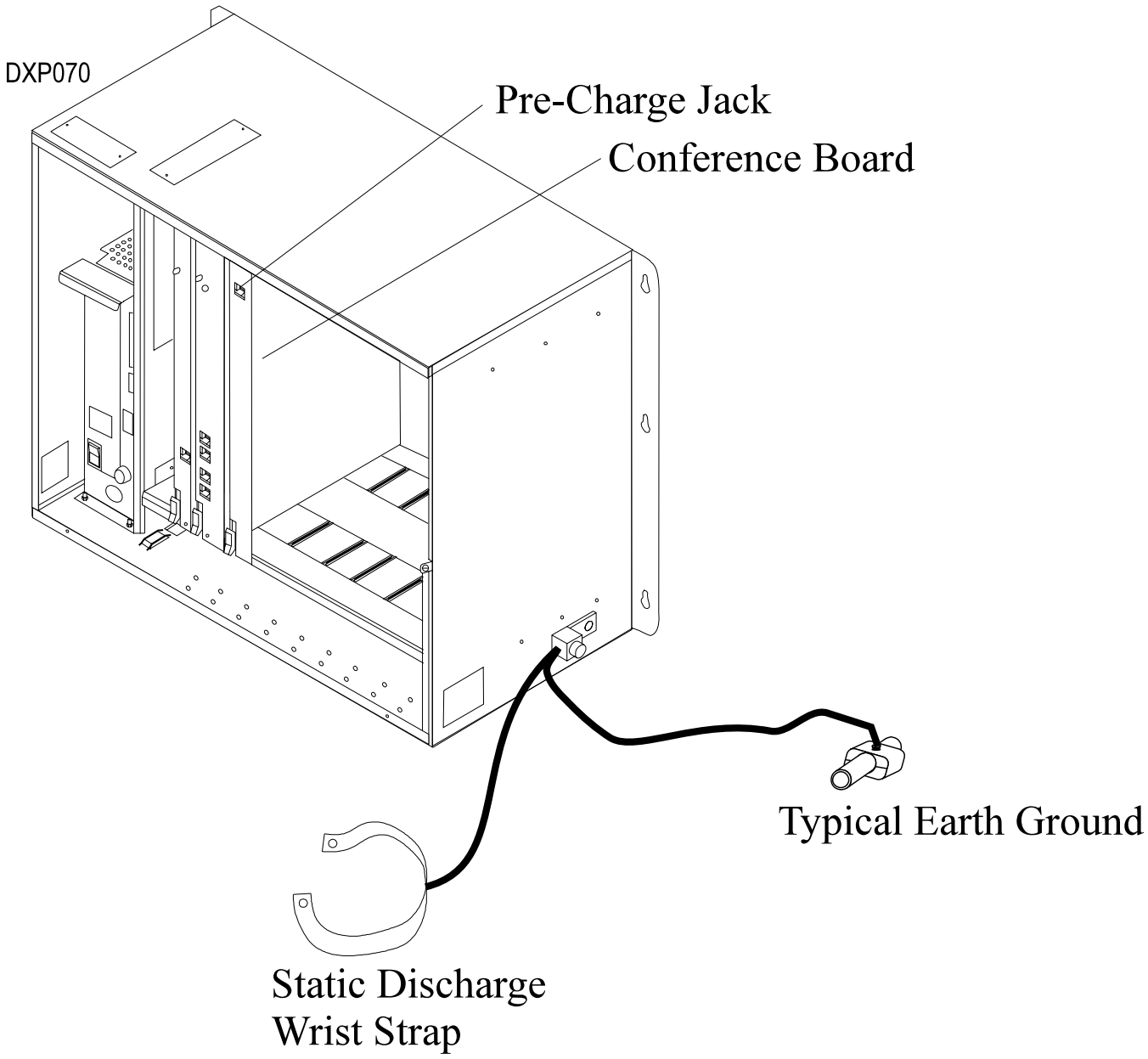
NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

3. Loosen the retaining hardware, and lift the front panel away from the common equipment.
4. Each conference board is supplied in a static protection bag for safe keeping. When you are ready to install the circuit board, remove it from its static protection bag.
5. Locate an unused universal board slot for conference board installation.
6. If you are installing the conference board in an operating system, connect the free end of the precharge cord that you installed in step 1 to the precharge jack on the station board.
7. Orient the conference board with its top and bottom guides in the cabinet's board cage. and press the board firmly until its board edge connection properly mates with the connector on cabinet's backplane.

CAUTION

When pressing circuit boards into place, press them only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

8. Repeat steps 4–7 until all circuit boards are installed.
9. Make a final inspection to ensure that the conference board is oriented correctly and mated properly.
10. Install and tighten the supplied screws to secure the conference board to the board cage.
11. Plug the AC line cord into the AC outlet, reconnect any battery back up equipment, and turn on the switch on the power supply.
12. Replace the front panel on the common equipment cabinet.



Viewing A Typical Conference Board Installation

COMDIAL®

Installing The Communications Card In The DXP Digital Communications System

1.0 Understanding The Communications Card

The DXP digital communications system supports the use of the DXOPT–COM communications card. The DXP uses this card just like it uses the serial ports on the main CPU board (OAI communication, VDT programming, printer functionality, for example). The communications card contains four serial communication ports and is attached to an auxiliary board installed in the main DXP system. You can install up to two serial communication cards on each auxiliary board, giving a total of 16 additional serial ports (if you have two auxiliary boards). *You can install the serial ports on either of the bottom two slots of the auxiliary board.*

The DXOPT–COM card requires DXP software release 5.3 or higher.

1.1 Communications Card Connections

The interface connector between the external device and the communications card is the same type standard modular jack used on the CPU board with the same pin configuration.

1.2 Data and Baud Rates

Each communication port can support various baud rates, data bits, stop bits, parity, and flow control. You can program these various options using the VDT programming. The maximum baud rate that the system will support is 9600, but there are some limitations involved. If a device is transmitting / receiving from the DXP at a high rate, Comdial engineers recommend that you use a communications protocol (RTS / CTS or XON / XOFF) to prevent buffer overrun and data loss.

NOTE: The auxiliary board can support one device active at any given time for 9600 baud transmit and receive. If you program multiple serial ports for any rate above 1200 baud and more than one of those ports is active in the same direction at the same time, the effective throughput may be less than the set value.

1.3 Connecting OAI Enterprise Applications To The DXP

Typically, PC applications that take advantage of Comdial's Enterprise Open Architecture Interface (Quick Q ACD, DXP Inntouch, for example) have a higher baud rate and throughput requirements. Comdial engineers recommend that you connect any of these applications to the main COM ports, rather than to a communications card.

1.4 Referring To Related Publications

You should also read and become familiar with the following applicable DXP publication:
✔IMI66-001, *Installation Instructions DXP Main Cabinet Assembly*

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2.0 Preparing For Installation

In installing options in the DXP cabinet, you will be handling sensitive electronic equipment, and you should pay careful attention to the following cautionary statement.

CAUTION

Electronic circuit boards are susceptible to damage caused by electrostatic discharge and must be handled accordingly. Refer to the Comdial publication IMI01-005, ***Handling Of Electrostatically Sensitive Components,*** *for general information. Specific handling precautions are also included in this installation instruction. The DXOPT-COM card, and the DXAUX board are supplied in static protection bags. Do not open a static protection bag prior to installation.*

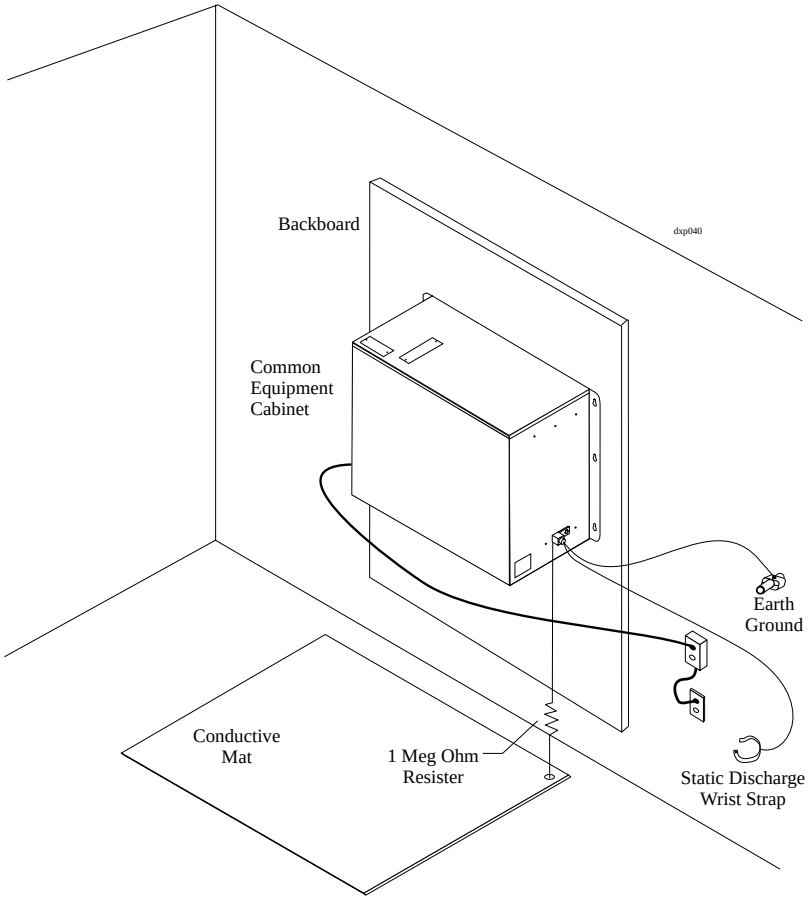
Before you perform any work on the DXP, make that area static safe, and before you begin the installation of the communications card on the auxiliary board, prepare a static-safe work area in which to do the work.

2.1 Preparing The DXP Work Area

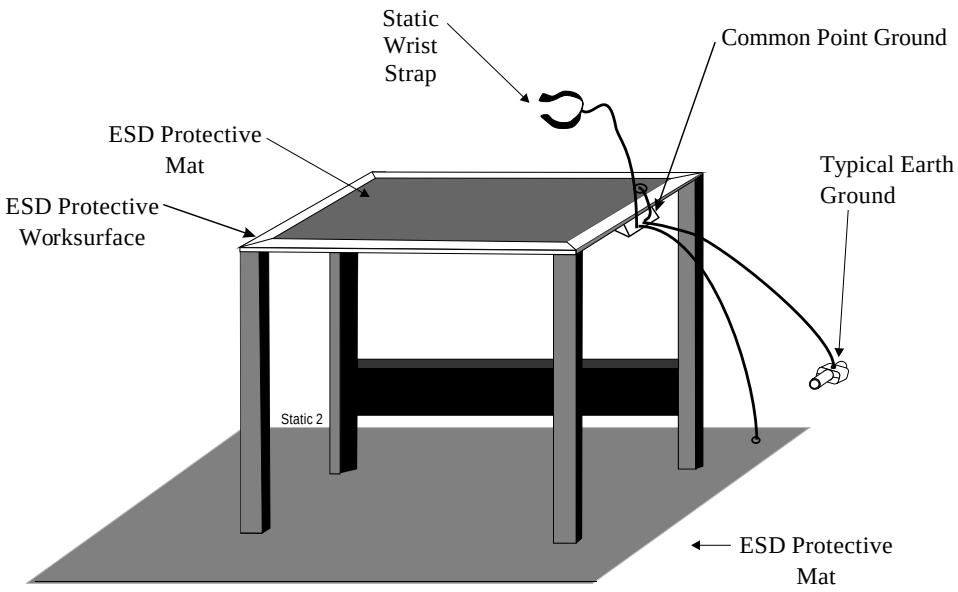
Place a conductive mat in front of the cabinet area and ground the mat to a good earth ground. (The third wire ground of the AC power line is an acceptable grounding point if the AC wall jack is properly grounded.) The grounded conductive mat will provide a safe static electric discharge path.

2.2 Preparing A Static-Safe Work Area.

When servicing electronic circuit boards, it is a good practice to do so at a static-safe work area prepared ahead of time. The drawings shown illustrate a typical static-safe work area.



Preparing The DXP Work Area



Preparing A Static Safe Work Area

3.0 Installing The Communications Card

The following procedure explains how to install the communications card on the auxiliary board.

1. Be sure you are standing on the conductive mat that you have placed in front of the cabinet area and grounded to a good earth ground. (The third wire ground of the AC power line is an acceptable grounding point if the AC wall jack is properly grounded.) The grounded conductive mat provides a safe static electric discharge path.
2. Install the static discharge wrist strap (supplied with the main cabinet) on your bare wrist, and adjust it for a snug fit. Be sure that the strap is in direct contact with your skin and not your clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground.

***NOTE**: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.*

3. Disconnect the AC power cord from the AC outlet and disconnect the optional battery back-up assembly from the main cabinet power supply

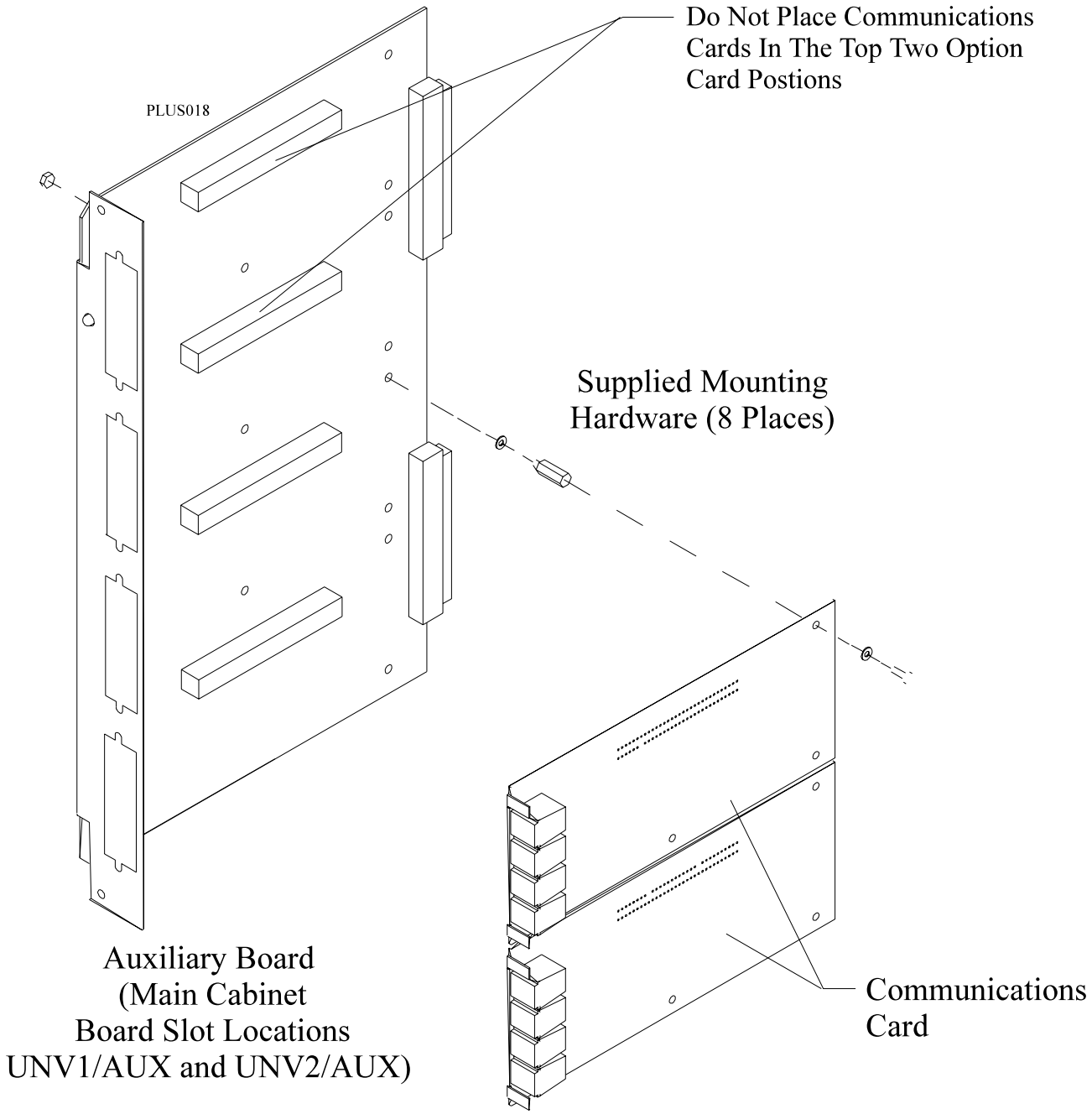
***NOTE**: If the DXP cabinet now contains an auxiliary board, follow step 4. If it does not, skip step 4 and go on to step 5.*

4. Locate the auxiliary board, loosen the retaining screws, remove it from the DXP main cabinet, place it in a static protection bag, and transport it to the static-safe work area.
5. At the static safe work area, with your wrist strap in place, remove the auxilary board and the communications card from their static protection bags.
6. Orient and attach the card to the board with the supplied hardware.
7. Place the auxiliary board and the newly installed communications card into a static protection bag and transport it back to the DXP main cabinet.
8. With your wrist strap properly grounded, remove the auxiliary board, with its installed communications card, from the static protection bag. Orient it with the top and bottom guides in the main cabinet board cage, and press it in firmly until its board edge connector properly mates with the connector on the backplane.
   You can install an auxiliary board in the main common equipment cabinet at board slots UNV1/AUX and UNV2/AUX.

   CAUTION

   When pressing the board into place, press it only at the extractor lever locations. If you apply pressure at other locations you may damage the board assembly.

9. Make a final inspection to ensure that the auxiliary board is located in the correct slot, oriented correctly, and mated properly then install and tighten the supplied screws to secure it to the board cage.
10. Connect the appropriate cabling to the communication card connector, and then replace the front panel on the DXP main cabinet.


Do Not Place Communications Cards In The Top Two Option Card Postions
PLUS018
Supplied Mounting Hardware (8 Places)
Auxiliary Board (Main Cabinet Board Slot Locations UNV1/AUX and UNV2/AUX)
Communications Card

Connecting The Communications Card To The Auxiliary Board

4.0 Identifying The Communications Card's Serial Data Port Connections

Each communications card provides four serial data ports. You can install two communications cards on each auxiliary board, and you can install two auxiliary boards in the main DXP common equipment cabinet. This combination provides 16 auxiliary serial data ports in addition to the two main serial data ports provided by the CPU board. Each serial data port is a standard 6–conductor modular jack that serves as the interface connection between an external data device and the DXP system. The system designates the location of each serial data port for data processing purposes.

5.0 Connecting Data Communications Equipment To The DXP

5.1 Selecting The Baud Rate

Each serial data communications port supports various baud rates, data bits, stop bits, parity, and flow control. You can program these various options using the data base programming; however, the maximum baud rate that you can assign to a serial data port is 9600 baud. Also, if a device is transmitting/receiving data from the DXP at a high rate, engineering sources recommend that you use a communications protocol (such as RTS/CTS or XON/XOFF) to prevent buffer overrun and data loss.

5.2 Making The Data Connections

When operating the serial data port at 9600 baud, your data cable run must be no longer than 500 feet.

Each serial data port is a standard 6–conductor modular jack that serves as the interface between an external data device and the DXP system.

When preparing a data cable for connection to a data device, refer to the manufacturer's manual for the equipment being interfaced, and make the wiring connections detailed in the following list:

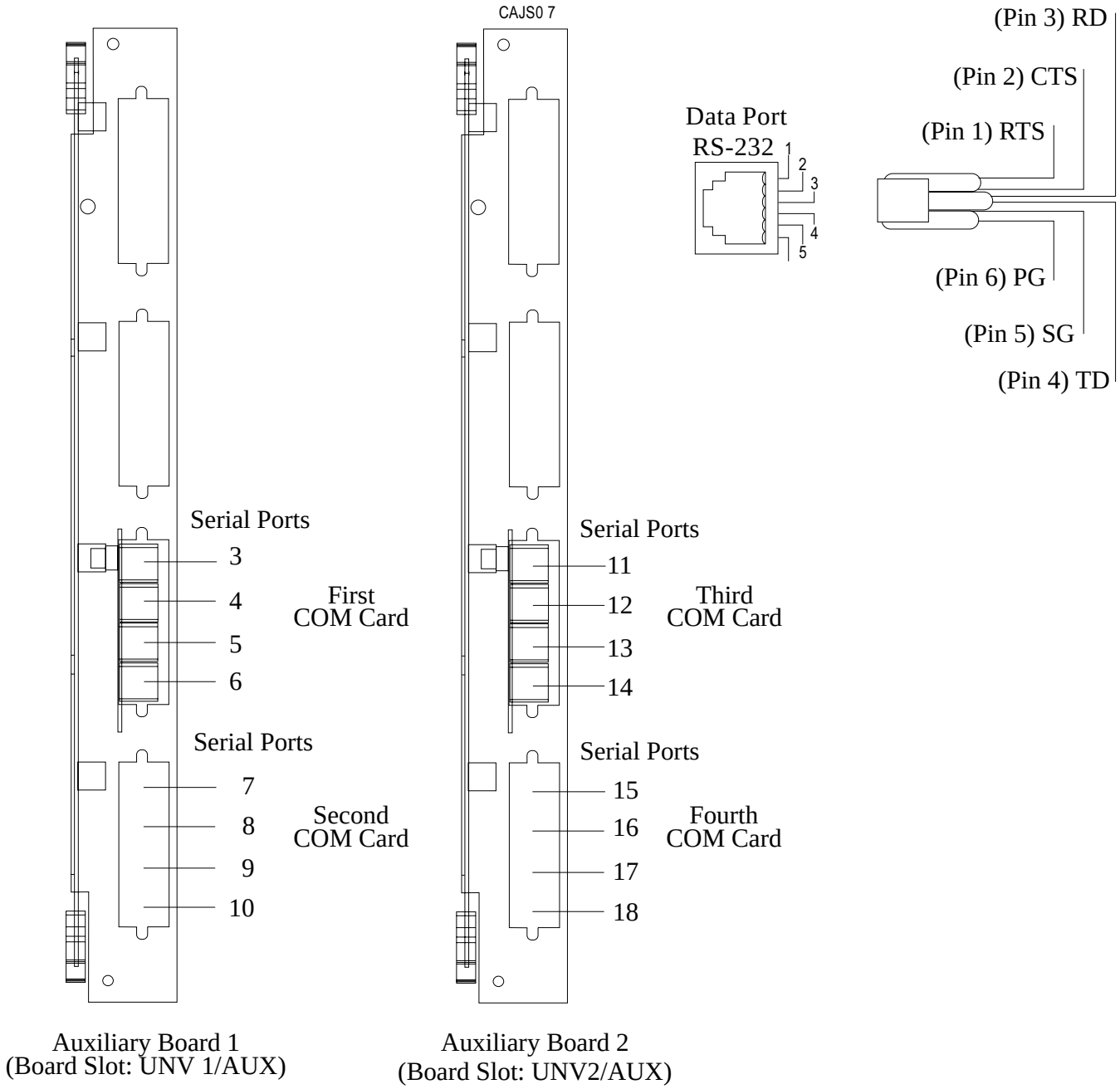
- Wire the common equipment RD (data from device to common equipment) connection to the device TD (transmit data) connection.
- Wire the common equipment TD (data to device from common equipment) connection to the device RD (receive data) connection.
- Wire the common equipment SG (signal ground) connection to the device SG (signal ground) connection.
- If required for proper operation, wire the common equipment CTS (clear-to-send status from device to common equipment) connection to the device RTS (request-to-send) connection.

NOTE: The common equipment requires a positive voltage, with respect to signal ground, in order to send data.

If the cable has spare wires, be sure to ground them so that they will not act as antennas and induce interference into the system. Further, if there is a source of RF power nearby (such as a radio transmitter), use shielded cable and ground the shield at both ends.

CAUTION

As an added precaution against induced interference, route the data cable as far away from any fluorescent lighting as you can reach, and make every effort to route the data cable perpendicular to other wiring.



Identifying The Serial Data Port Locations

COMDIAL®

Installing The BBLDX External Battery Assembly

Introducing The BBLDX Assembly

The BBLDX external battery assembly is for use with the DXP digital communications system. The assembly includes the following items:

- Batteries: Five 6-volt, 20 ampere-hour, GC Portalac Model PE6V20* (Comdial product code BT000-131) *GS Portalac, City Of Industry CA, 91748
- Metal enclosure with wire harness, includes combination circuit breaker, on/off switch

Should the AC power to the system be interrupted, one BBLDX external battery assembly provides a minimum of 1.0 hour of operation for a fully loaded main cabinet assembly or .5 hours of operation for a fully loaded main cabinet and expansion cabinet assembly. Add another BBLDX in parallel with the first assembly to extend the time to a minimum of 2.0 hours of operation for a fully loaded main cabinet assembly or 1.0 hour of operation for a fully loaded main cabinet and expansion cabinet assembly. The DXP system supports a maximum of two external battery assemblies. Calculate the minimum battery backup time provided by one BBLDX assembly to a fully configured DXP system using the following formula:

$$T = \frac{Ke}{1 + [(0.13)(N)]}$$

T = Back-up time in hours
K = 0.6 (Constant)
e = 20 (ampere-hour capacity of BBLDX)
N = Total number of stations

Example:
Assume that a DXP main cabinet providing 80 station capacity is installed along with a BBLDX battery assembly to provide back-up power.

$$T = \frac{(.6)(20)}{1 + [(0.13)(80)]} = \frac{12.0}{11.4} = 1.05 \text{ Hours}$$

During AC operation, the DXP system provides re-charging current to maintain the voltage potential of the BBLDX battery assembly at an operational level. The charging circuit may not provide an adequate charge if an installed battery assembly has a current rating of greater than 40 ampere-hours.

NOTE: One BBLDX external battery assembly requires approximately 12 hours to completely re-charge to full potential after it has been completely discharged and, in some cases, when initially installed. Adding another battery assembly extends the required re-charge time to approximately 24 hours.

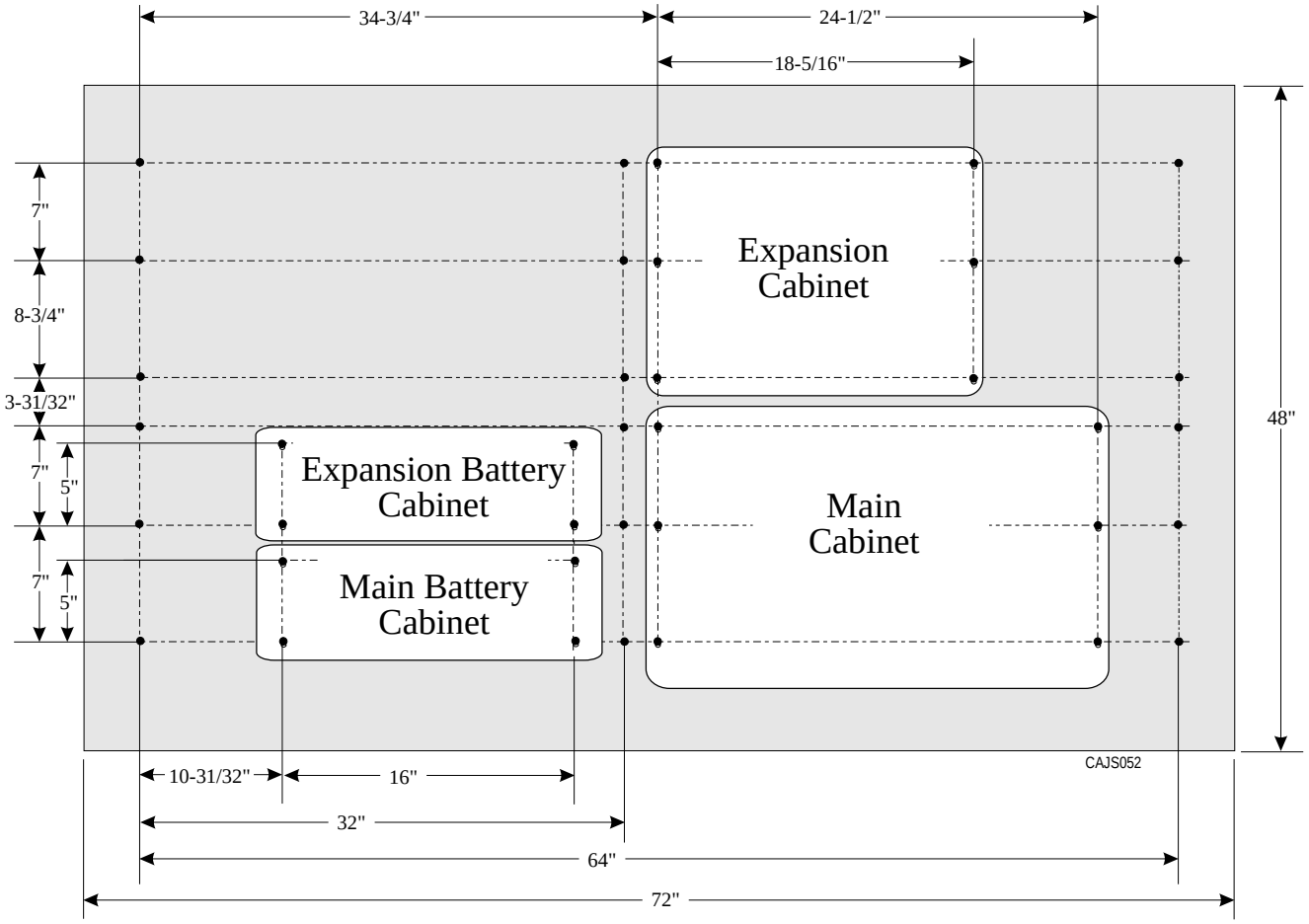
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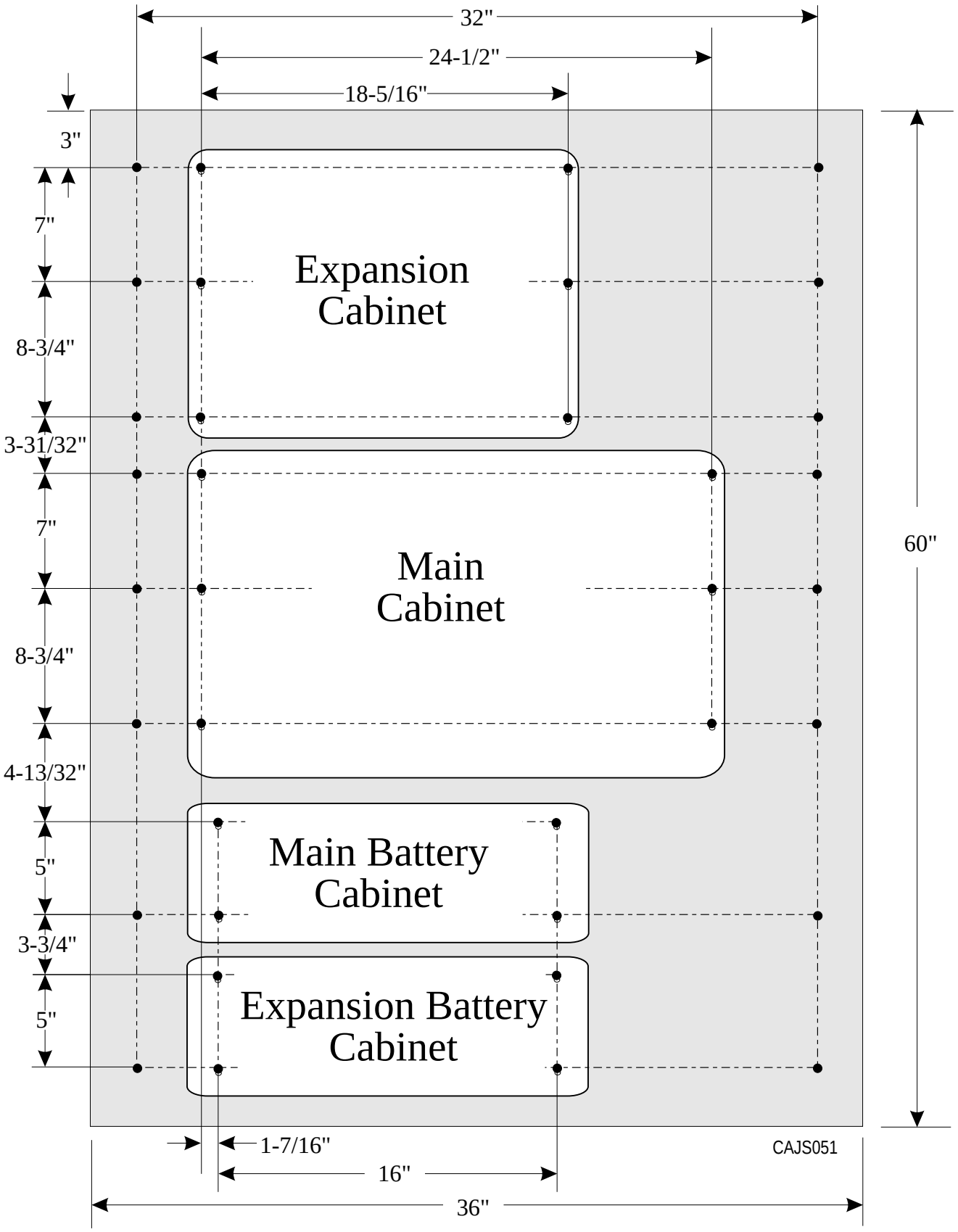
Mounting The BBLDX Cabinet

This BBLDX external battery assembly is shipped from the factory with the harness installed in the enclosure, and with the batteries packaged separately.

1. Remove the lid from the empty metal enclosure and save the retaining hardware.
2. Mount the empty cabinet near the DXP main cabinet either to its left or just below it. Note the location of an expansion battery cabinet if the site requires one. When wall mounting the battery assembly directly to a wall, drive the mounting screws into the underlying wall studs and not just into the wall material alone. If necessary, attach a mounting board to the wall and then attach the battery assembly cabinet to the mounting board.
3. When a site requires an expansion battery cabinet, remove the appropriate access plates from the main battery cabinet and the expansion battery cabinet before mounting them.



Mounting The BBLDX Cabinets To The Left Of The DXP Cabinet

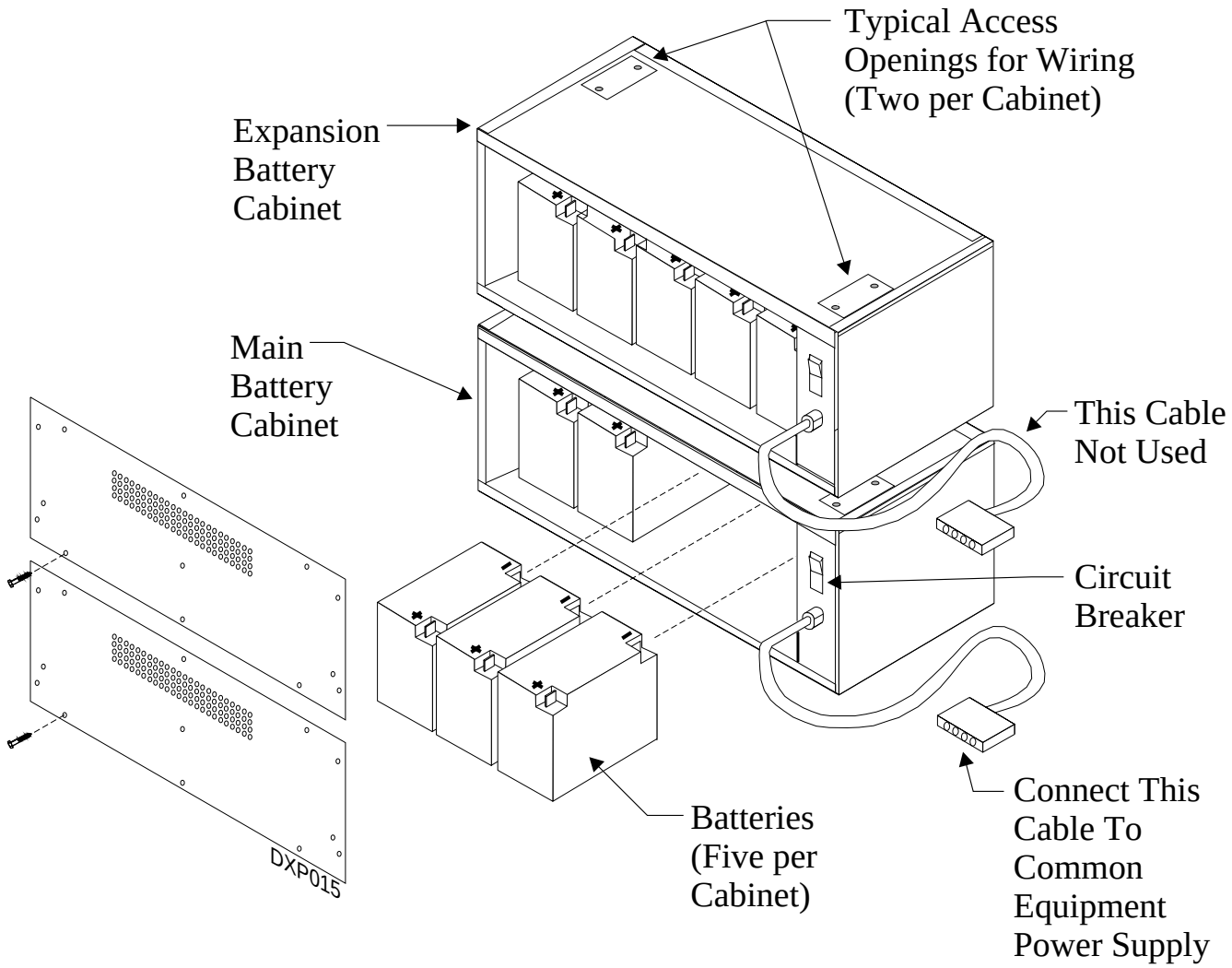


Mounting The BBLDX Cabinets At The Bottom Of The DXP Cabinet

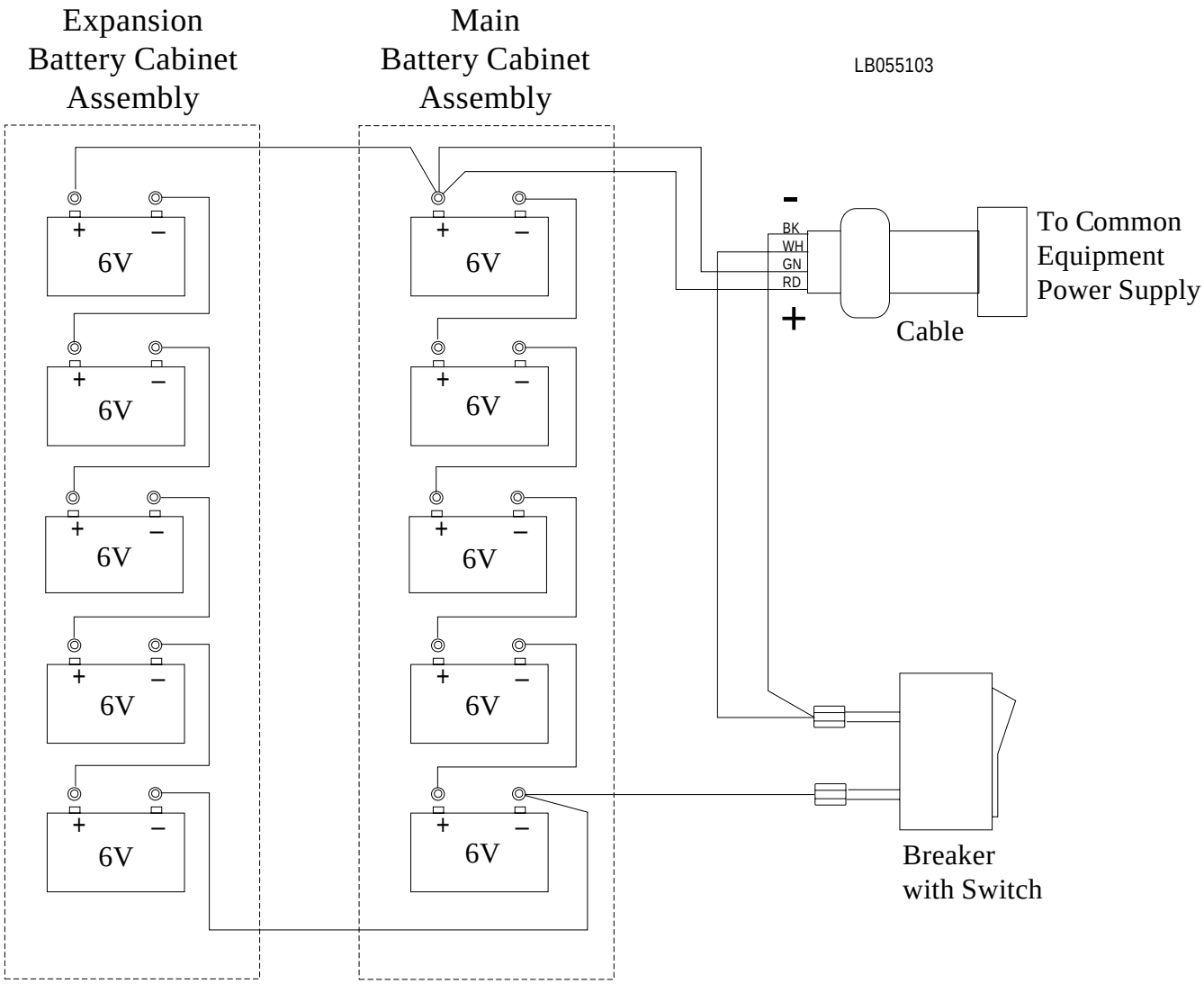
Assembling and Wiring The BBLDX When Mounted To Left Of The DXP Cabinet

For expansion capability, route the two wires to the expansion battery cabinet through the access openings in the top and bottom of the two cabinets.

1. Connect the wiring harness to the batteries per the illustration.
2. Install the batteries in the metal enclosure(s) per the illustration and replace the lid.
3. Connect the BBLDX to the DXP main cabinet per the instructions provided in the system manual supplied with the DXP system.


Typical Access Openings for Wiring (Two per Cabinet)
Expansion Battery Cabinet
Main Battery Cabinet
This Cable Not Used
Circuit Breaker
Batteries (Five per Cabinet)
Connect This Cable To Common Equipment Power Supply
DXP015

Installing The Batteries



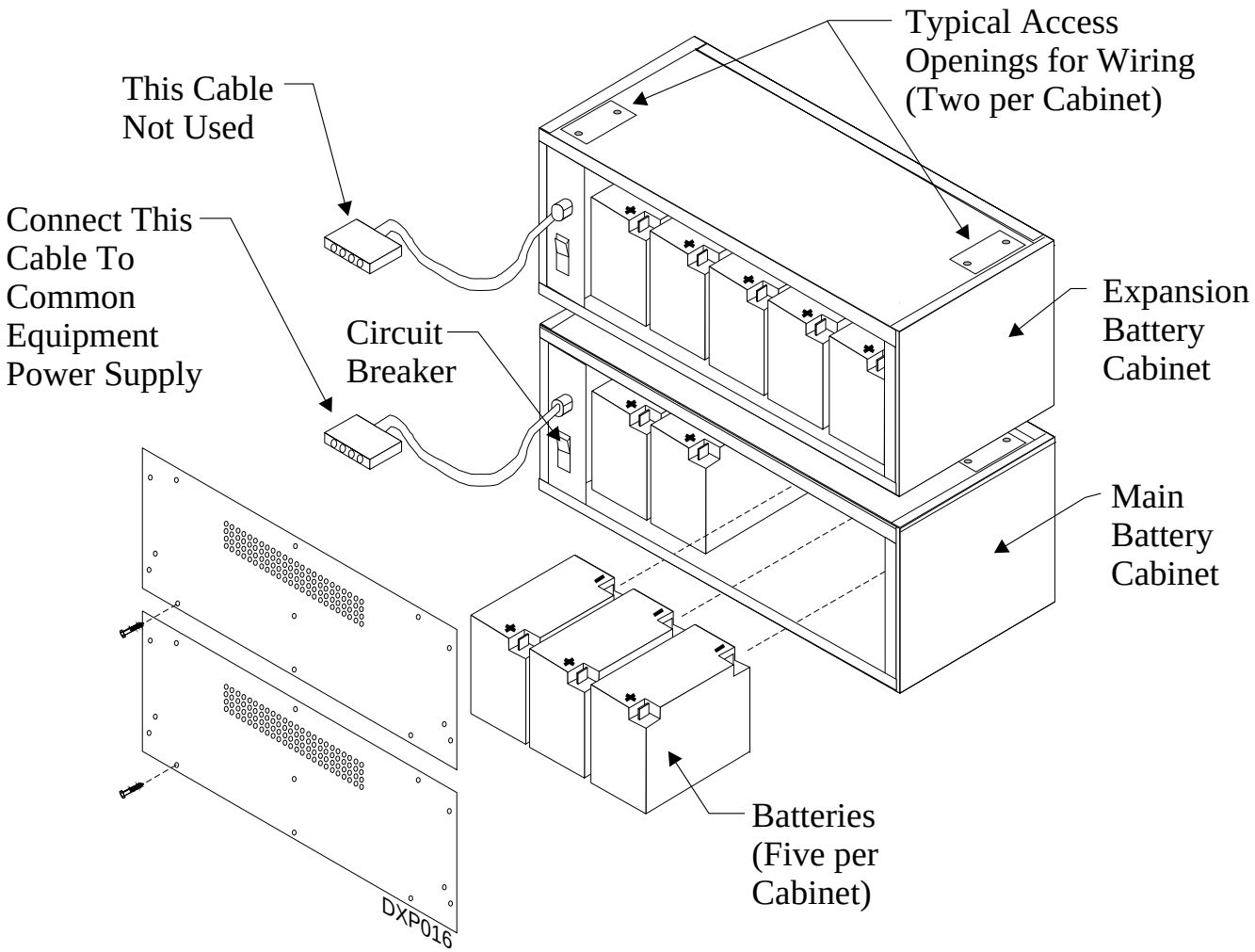
***NOTE**: Press breaker firmly to insure actuation.*

Wiring The Batteries

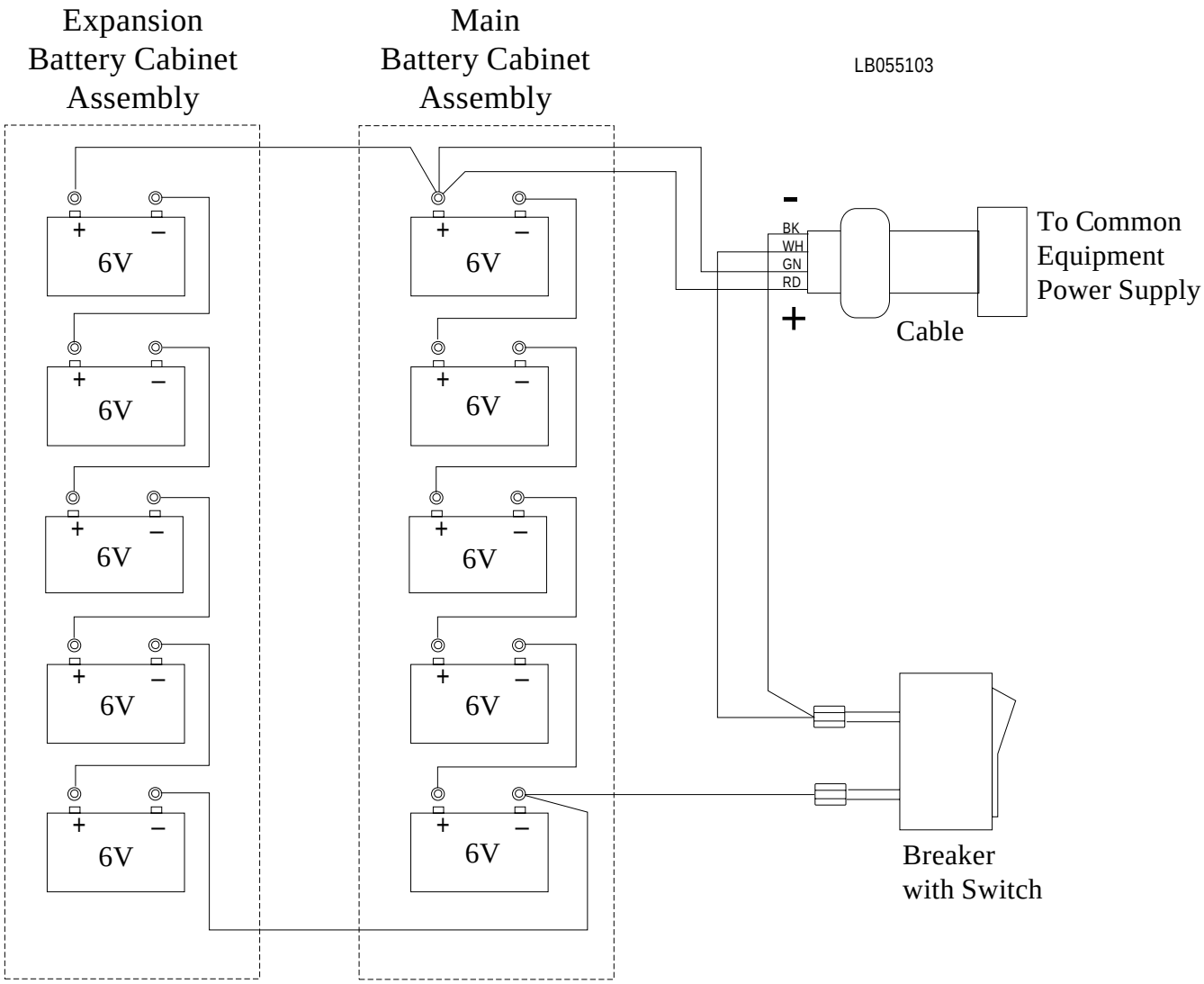
Assembling and Wiring The BBLDX When Mounted To The Bottom Of The DXP Cabinet

For expansion capability, route the two wires to the expansion battery cabinet through the access openings in the top and bottom of the two cabinets.

1. Connect the wiring harness to the batteries per the illustration.
2. Install the batteries in the metal enclosure(s) per the illustration and replace the lid.
3. Connect the BBLDX to the DXP main cabinet per the instructions provided in the system manual supplied with the DXP system.


Typical Access Openings for Wiring (Two per Cabinet)
This Cable Not Used
Connect This Cable To Common Equipment Power Supply
Circuit Breaker
Expansion Battery Cabinet
Main Battery Cabinet
Batteries (Five per Cabinet)
DXP016

Installing The Batteries

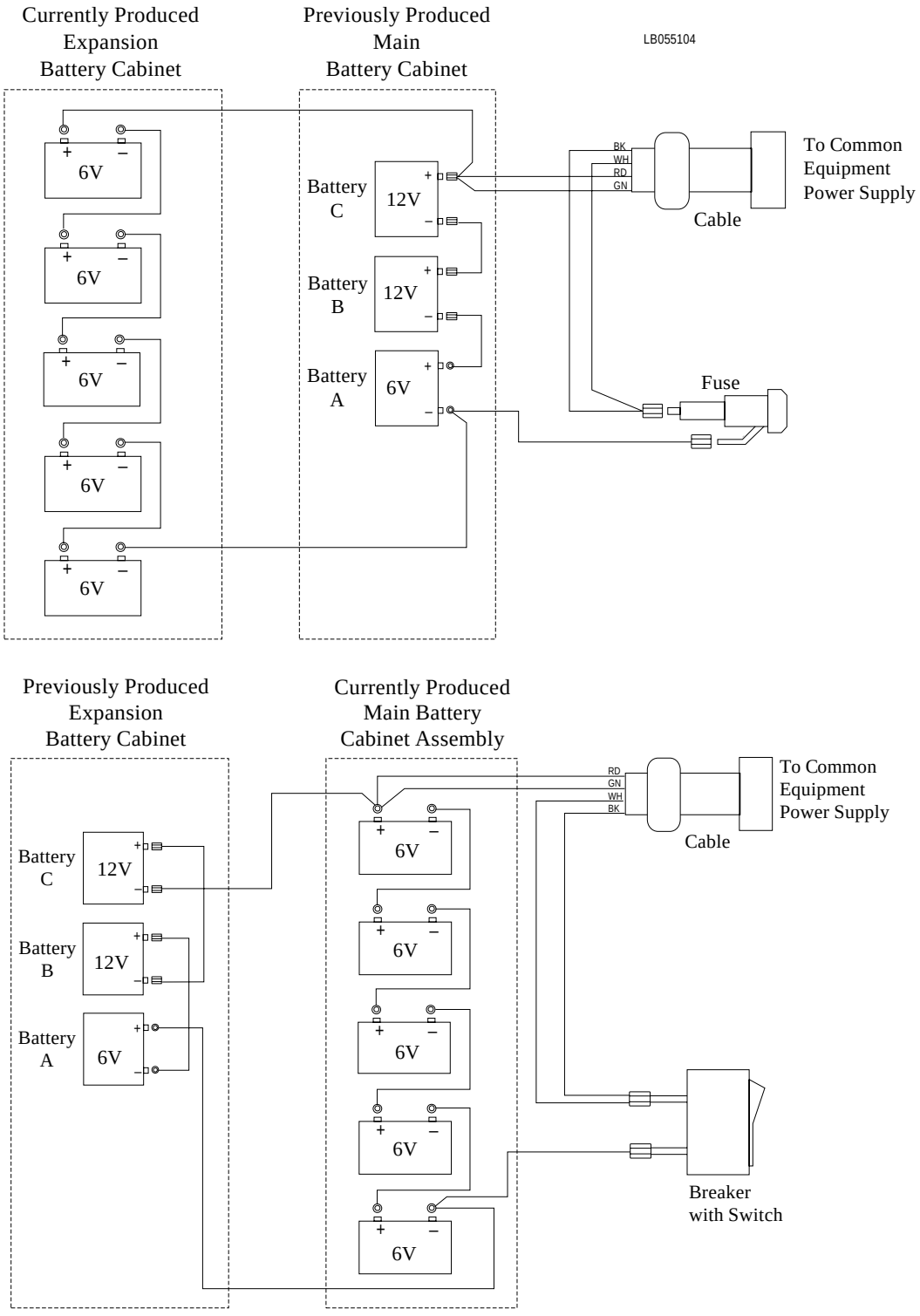


***NOTE**: Press breaker firmly to insure actuation.*

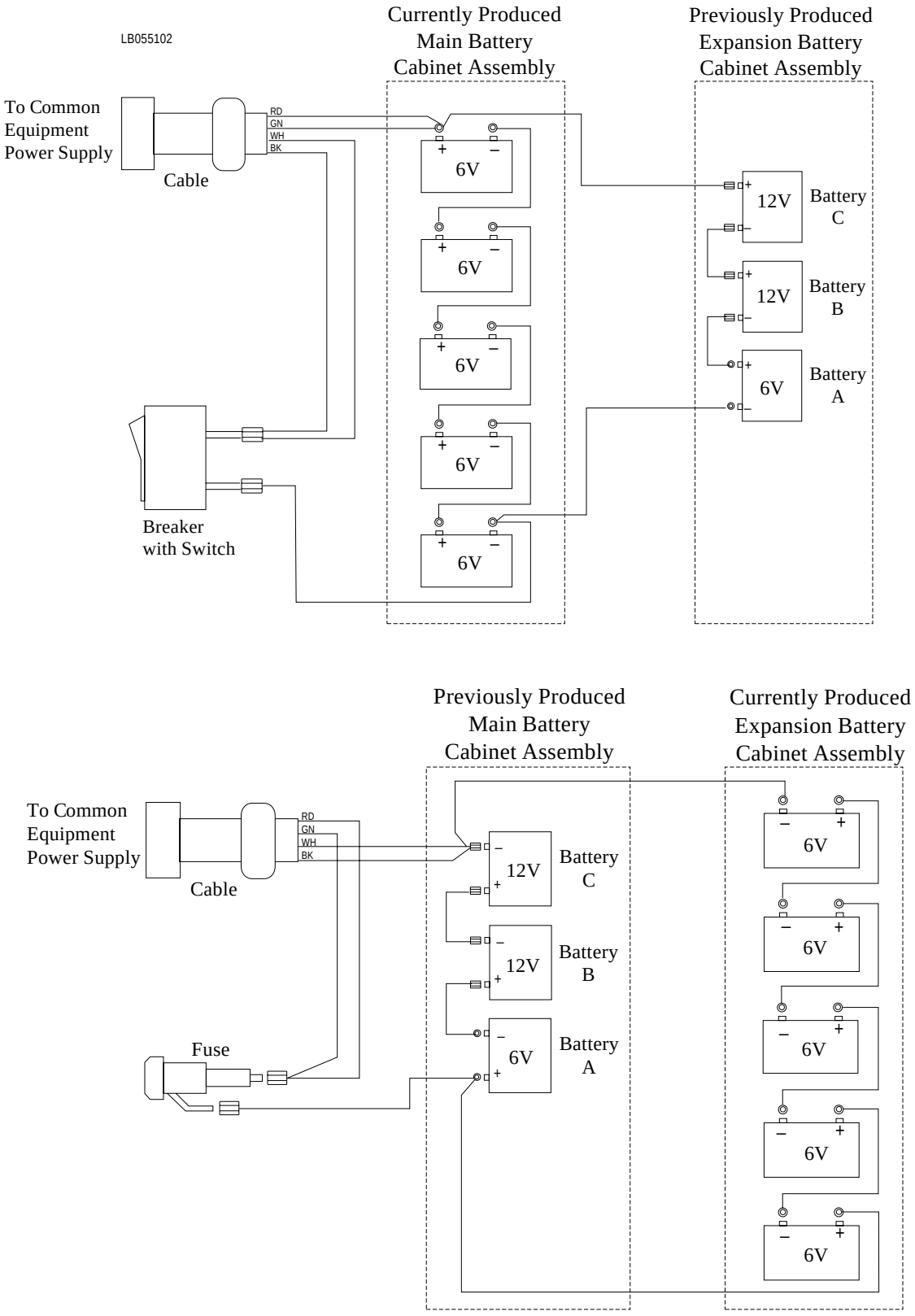
Wiring The Batteries

Interfacing Currently Produced BBLDX Battery Assemblies With Previously Produced BBLDX Battery Assemblies

You can interconnect the currently produced BBLDX Battery Assemblies with previously produced assemlies currently installed in the field or stored in warehouse stock awaiting installation. Use the following illustrations for connection details.



Interconnecting Current And Previously Produced Battery Assemblies Mounted To Left Of DXP Cabinet



Interconnecting Current And Previously Produced Battery Assemblies Mounted At The Bottom Of DXP Cabinet

Special Cautionary Battery Information

- Do not dispose of batteries in a fire as the cells may explode. Check with the local codes for possible disposal instructions.
- Do not open or mutilate the batteries. Released electrolyte is corrosive and may cause damage to the eyes or skin. It may be toxic if swallowed.
- Exercise care in handling batteries in order not to short the battery with conducting materials such as rings, bracelets, and keys. The battery may over-heat and cause burns.
- Charge the batteries provided with or identified for use with the DXP digital communications system only in accordance with the instructions and limitations specified in the system manual supplied with the DXP system.
- Observe proper polarity orientation when installing the batteries.
- Do not mix old and new batteries in the BBLDX assembly.
- Do not mix batteries of different sizes or from different manufacturers in this product.

NOTICE



This symbol, when encountered on the equipment cabinet or on other installed hardware, means: CAUTION—refer to the instruction manual.

Verifying The Battery Voltage

Every three months, use an accurate voltmeter to measure the no-load voltage of the BBLDX. The measured voltage range should be within 27–35 volts.

If the BBLDX no-load voltage is lower than 27 volts, measure the charging voltage supplied by the common equipment cabinet. The measured charging voltage must be within 34.5–35 volts.

If the charging voltage is not within range or if the voltage of a freshly-charged BBLDX is no greater than 30 volts, contact your technical service representative.

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INTERTEK CERTIFICATION
ACCREDITED REGISTRAR ANSI-RAB
Comdial's Quality Management System Is Certified To The ISO 9001 Standard.

COMDIAL®

Installing The DXP 120/230 Volt Power Supply Assembly

1.0 Introducting The Power Supply Assembly

This publication discusses the installation of the international IEC 950 approved, 120/230 volt power supply assemblies for the DXP main and expansion common equipment cabinets.

Location	Product Code
Main Cabinet	DXPSM-INT
Expansion Cabinet	DXPSX-INT
Voltage Ranges	90–129 VAC at 50/60 Hz 200–254 VAC at 50 Hz

The power supply assembly is packed separately from the common equipment cabinet; therefore, you should unpack and carefully inspect it for shipping damage and notify the shipper of any damages you find. Also, verify that the package contains all parts and accessories needed for proper installation and operation.

Refer to IMI66-001, *Installation Instructions DXP Main Cabinet Assembly* for complete installation instructions of the main DXP cabinet and to IMI66–002, *Installation Instructions DXP Expansion Cabinet Assembly* for complete installation instructions of the DXP expansion cabinet.

Both the DXPSM-INT and DXPSX-INT power supply assemblies are protected with a 6.3A, 250V slow-blow fuse. A replacement fuse must have the same rating. A compatible fuse is the Littlefuse 21806.3 or an equivalent to it. *(Littlefuse is a registered trademark of Littlefuse Inc., Des Planes, Ill., 60016.)*

NOTE: Both the DXPSM-INT and DXPSX-INT power supply assemblies employ electronic switching circuitry in their design. During operation, power supplies of this type generate an audible sound from their switching regulators. This sound is normal and is not an indication that the power supply is operating improperly.

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2.0 Placing the Source Voltage Strap

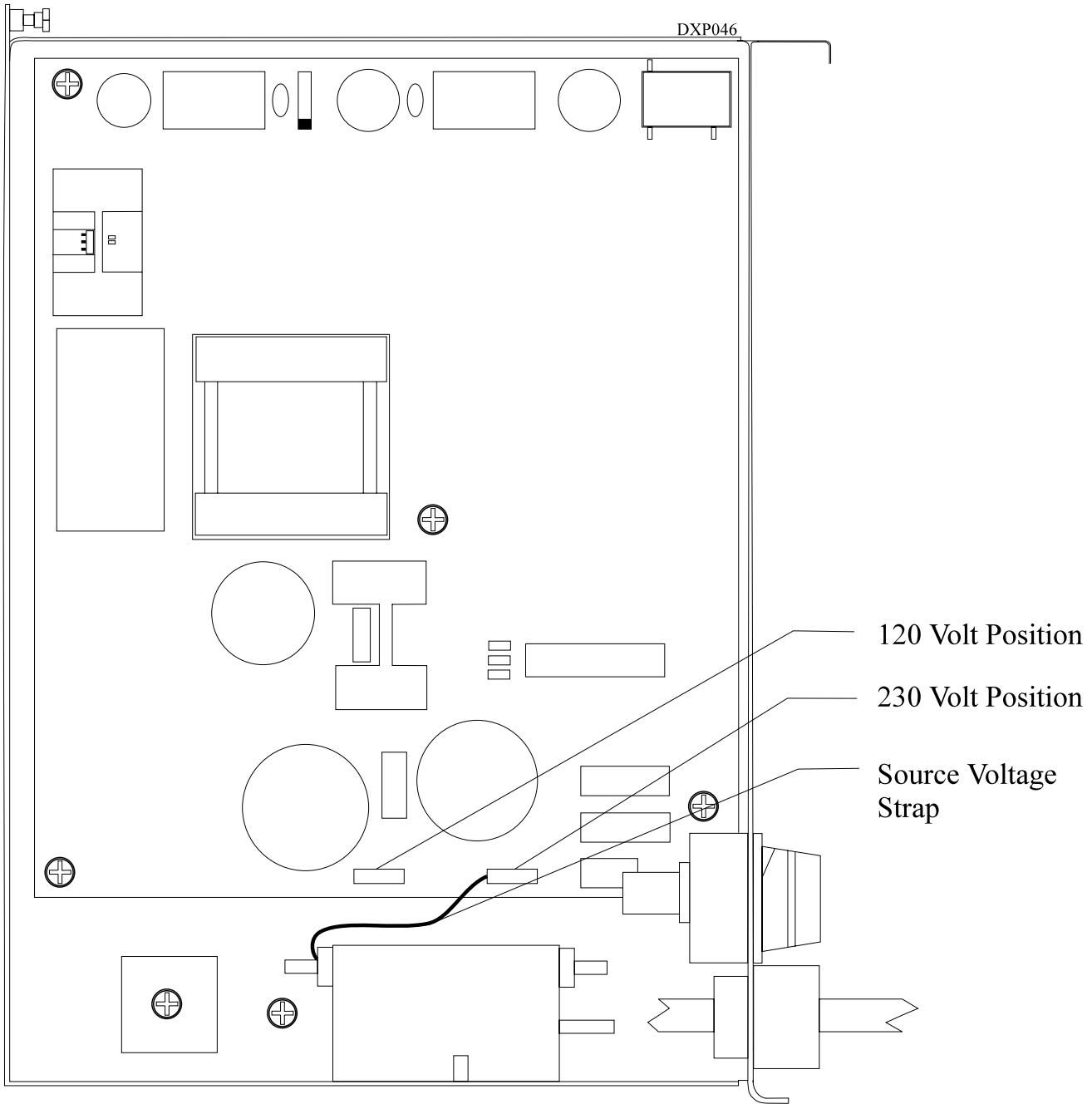
Both the DXPSM-INT and DXPSX-INT power supply assemblies are shipped from the factory strapped for 230 VAC operation. They are designated as such by a label attached to the chasis If you plan to operate them from 120 VAC, you must re-strap them for that voltage source. If you re-strap them for 120 VAC operation, change the label marking on the chassis to indicate this.

CAUTION

Be sure that you strap both the main and the expansion supplies for the same voltage source. If you fail to do this, damage to the power supply assemblies could result.

To restrap the power supply assemblies to match the local AC voltage requirements,

1. Remove cover screws from left side of assembly and set cover aside.
2. Refer to illustration at left for orientation and location of strap.
3. Place strap on desired PWB terminal.
4. Replace cover and secure with screws removed in step 1.



Placing The Source Voltage Strap

3.0 Installing The Power Supply In The Main DXP Main Cabinet

1. Remove the DXPSM-INT power supply assembly from the carton. Be sure to save the small bag containing the mounting hardware.
2. Verify that voltage strap on the power supply assembly, matches the source voltage. See page 2 for details.
3. Slide the DXPSM-INT into the opening at the left side of the main common equipment cabinet and lower the front mounting holes over the threaded studs protruding up from the cabinet frame.
4. Route the power cable from behind the DXPSM-INT up to the connector on the backplane and connect it.
5. Remove the two #8-32 hex nuts and lock washers from the bag and install them on the threaded studs to secure the power supply in place. Be sure to tighten them securely.
6. Note that the DXPSM-INT has a locking-screw held captive to the tab at the assembly. Tighten this screw into to standoff located on the back of the cabinet.
7. Route the AC line cord through the square opening in the side of the main cabinet. Be sure to do this before you install the AC power plug (see page 8)

   CAUTION

   DO NOT attach or secure the line cord to the surface of the mounting location.
8. The DXPSM-INT includes a ferrite collar. Snap this collar around the AC power cord to provide protection against radio frequency interference.
9. If you plan to include battery back-up as part of the installation, route the DC cable to the main cabinet and connect it to the battery back-up connector on the DXPSM-INT.

3.1 Grounding The Main Common Equipment Cabinet

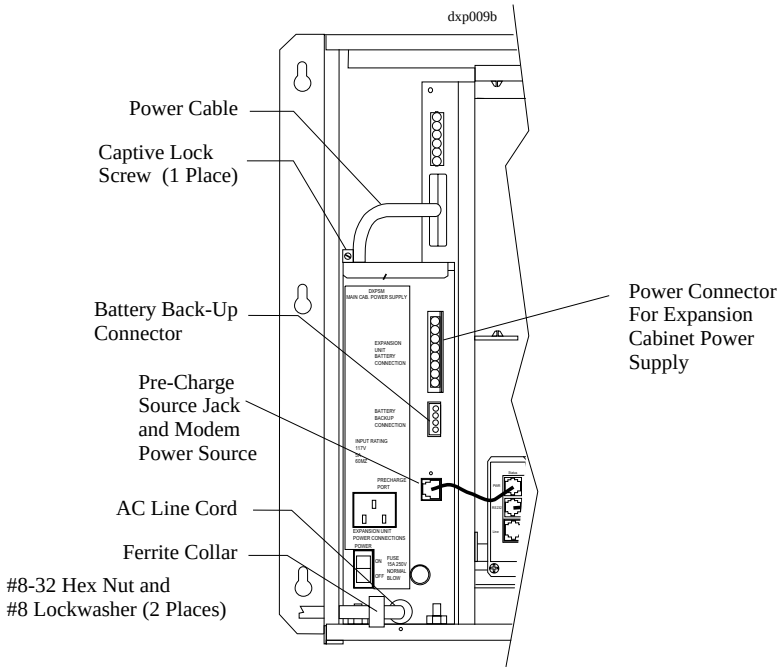
Proper DXP grounding is necessary for trouble-free operation and personnel safety. The DXP has the following three types of grounds:

- Service Ground–a neutral power line wire that is connected to the ground bus in the premises' AC power panel,
- System Ground–a non-current carrying power line wire that is connected to the ground bus in the premises' AC power panel,
- Frame Ground–a low impedence conductor that places the DXP's chassis at reference ground potential. The frame ground provides the greatest safety by limiting electrical potential between non-current carring parts of the DXP system. The DXP provides a ground stud on its cabinet for access to its frame ground.

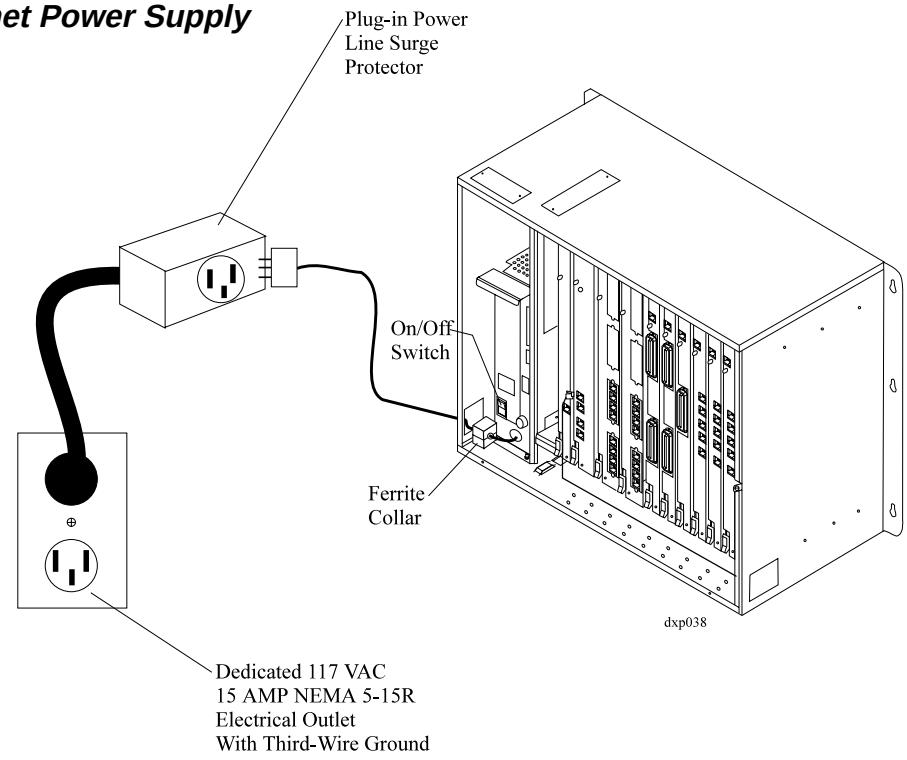
Effective grounding requires that you connect the DXP's frame ground to a good earth ground. A good earth ground is one such as the ground bus in the premises' AC power panel or a public metalic cold water pipe at a point immediately at its entrance to the premises and ahead of any meters, pumps, or insulating sections that have been added for vibration reduction. Avoid using the premises' structural steel frame as it may not be at earth ground potential. Make the ground connection between the main cabinet and earth ground with #6 or larger insulated, solid copper grounding wire. Keep this wiring separate from the three-wire AC line cord, do not splice it, and keep it as short as possible.

The impedence of the wiring between the DXP and the earth ground must not exceed 0.25 ohms and the impedence between the earth ground and the power company's reference standard ground must not exceed 5 ohms. Use an acceptable low impedence measuring device to measure the impedence of these paths. The #6 or larger wire size will minimize the wiring impedence; however, if the impedence between earth ground and the power company's standard reference ground exceeds 5 ohms, contact the local power company.

Be sure that all of the ground connections are visible for inspection and maintenance. Tag all of the ground connections with a sign that reads: Do Not Remove Or Disconnect.


dxp009b
Power Cable
Captive Lock Screw (1 Place)
Battery Back-Up Connector
Pre-Charge Source Jack and Modem Power Source
AC Line Cord
Ferrite Collar
#8-32 Hex Nut and #8 Lockwasher (2 Places)
Power Connector For Expansion Cabinet Power Supply

Installing The Main Cabinet Power Supply


Plug-in Power Line Surge Protector
On/Off Switch
Ferrite Collar
dxp038
Dedicated 117 VAC 15 AMP NEMA 5-15R Electrical Outlet With Third-Wire Ground

Grounding The Main Cabinet

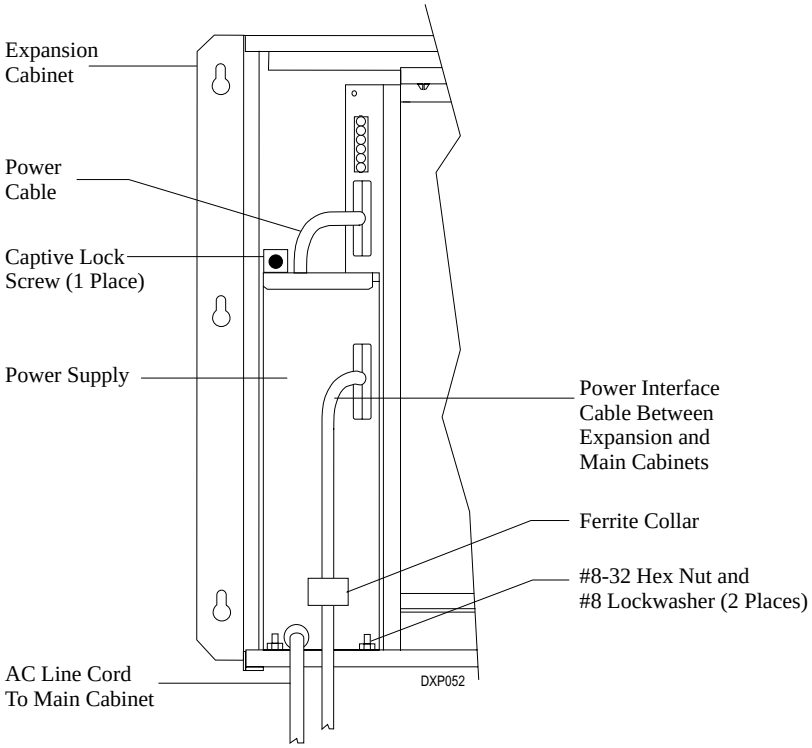
4.0 Installing The Power Supply In The DXP Expansion Cabinet

1. Be sure to ground the common equipment expansion cabinet to the main cabinet with a #6 insulated, solid copper wire. A ground stud is located on the common equipment expansion cabinet for this purpose. For best protection, always keep the ground wire as short as possible.
2. Remove the DXPSX-INT power supply assembly from the carton. Be sure to save the small bag containing the mounting hardware.
3. Verify that the voltage strap on the DXPSX-INT expansion cabinet power supply assembly, matches the strap setting on the DXPSM-INT main cabinet power supply assembly.
4. Slide the DXPSX-INT into the opening at the left side of the expansion cabinet and lower the front mounting holes over the threaded studs protruding up from the cabinet frame.
5. Remove the two #8-32 hex nuts and #8 lock washers from the bag and install them on the threaded studs to secure the power supply assembly in place. Be sure to tighten them securely.
6. Note that the DXPSX-INT has a locking-screw held captive to the tab at the rear of the assembly. Tighten this screw into to standoff located on the back of the cabinet.
7. Route the cable from the DXPSX-INT to the right edge and below the ring generator mounting rails up to the connector on the backplane and connect it there.
8. Route the supplied power interface cable between the DXPSX-INT and the main cabinet power supply assembly and connect it at both places.
9. Obtain the ferrite collar that is included with the DXPSX-INT, and snap it on the power interface cable.
10. Route the AC line cord from the DSPSX-INT through the front square openings in the bottom of the expansion cabinet and the top of the main cabinet (exposed by removing the access plates during cabinet installation) to the front of the main cabinet power supply assembly and connect it at both places.

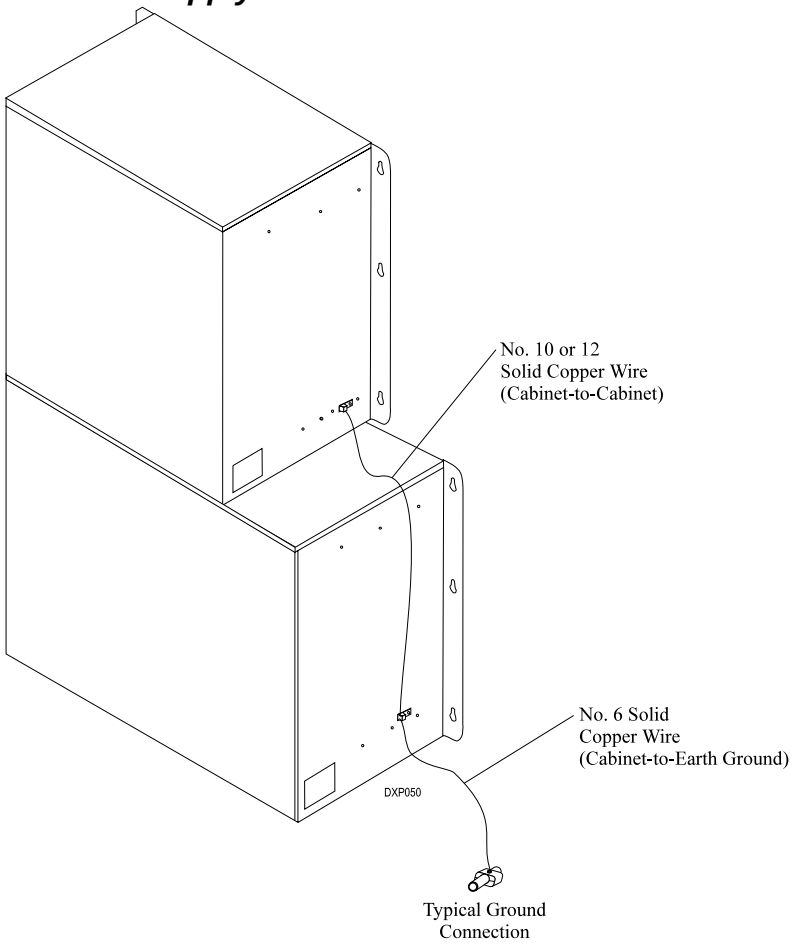
4.1 Grounding The Expansion Cabinet

Use #10 or #12 or larger insulated, solid copper grounding wire to connect the frame ground of the expansion cabinet (available through the ground stud on the cabinet's side) to the frame ground of the main DXP cabinet.

Be sure that all of the ground connections are visible for inspection and maintenance. Tag all of the ground connections with a sign that reads: *Do Not Remove Or Disconnect*.


Expansion Cabinet
Power Cable
Captive Lock Screw (1 Place)
Power Supply
Power Interface Cable Between Expansion and Main Cabinets
Ferrite Collar
#8-32 Hex Nut and #8 Lockwasher (2 Places)
AC Line Cord To Main Cabinet
DXP052

Installing The Expansion Cabinet Power Supply


No. 10 or 12 Solid Copper Wire (Cabinet-to-Cabinet)
No. 6 Solid Copper Wire (Cabinet-to-Earth Ground)
DXP050
Typical Ground Connection

Grounding The Expansion Cabinet

5.0 Installing The AC Power Plug

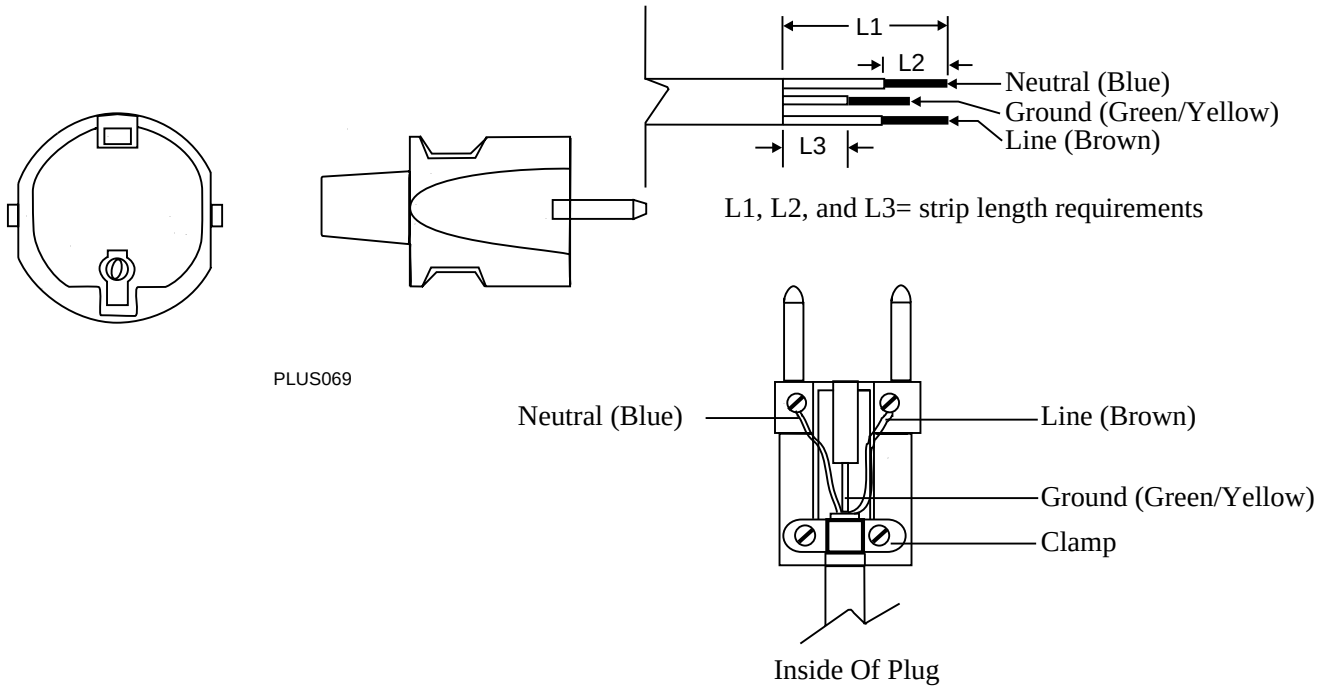
The line cord is terminated with a typical continental European plug matching the CEE 7/7 standard. If this plug does not meet the site needs, you can install a plug of the proper type for your installation.

CAUTION

If you replace the plug, be sure to route the line cord through the DXP cabinet opening before you install the plug on the cord.

To install a line cord plug,

- familiarize yourself with the requirements for the plug that you plan to install on the unterminated line cord (the illustration shows a typical continental European plug matching the CEE 7 standard),
- strip off the insulation from the line cord wires according to the requirements for your plug,
- open the plug and slide its outer shell onto the line cord,
- connect the ground, neutral, and line wires according to the requirements for your plug,
- if your plug includes a clamp, tighten it on the line cord,
- reassemble the plug,
- test the installation for open and short circuits using an ohm meter.



Standard Wire Color		
Power Source	**Wire Color**	
	Europe	**USA**
Line	**Brown**	**Black**

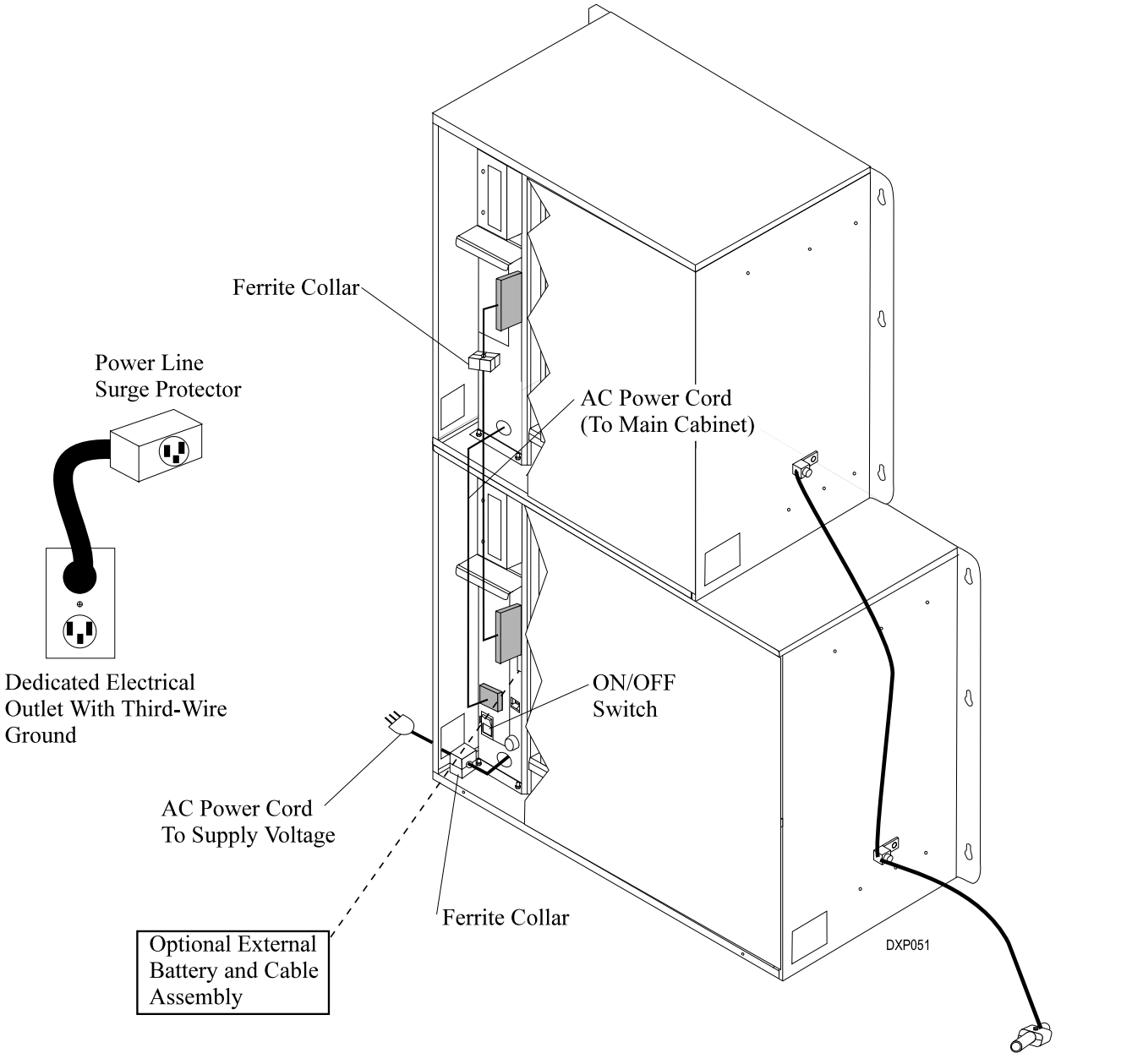
Installing A Typical Continental European AC Power Plug

6.0 Connecting The AC Power To The System

CAUTION

Do not connect the AC power cord until you have installed all of the circuit boards in the main and expansion cabinets and checked the installation.

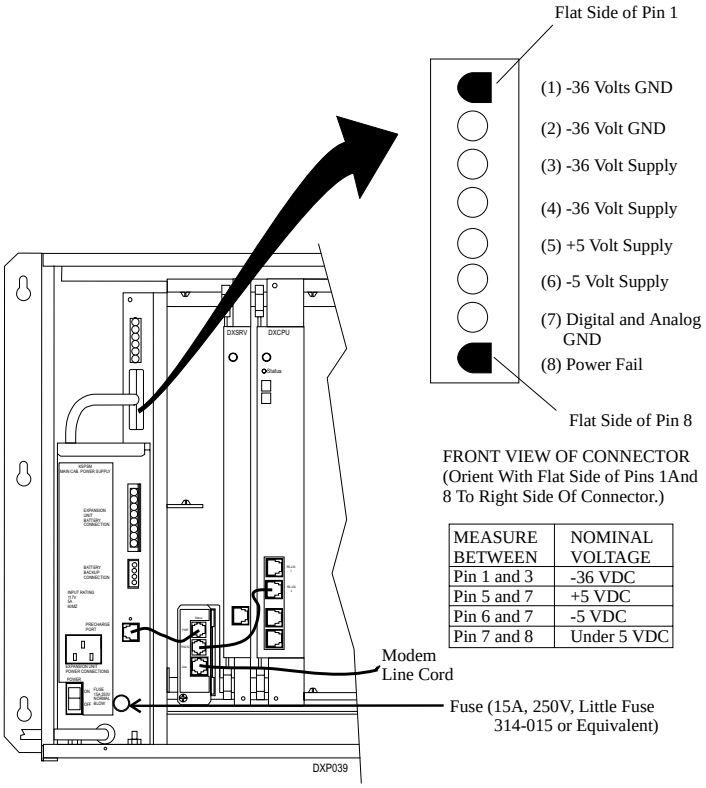
- Employ a dedicated 15 AMP circuit, with a third-wire ground, supplied to a separate electrical outlet for the AC power connection.
- Install a plug-in power line surge protector between the power cord and the AC outlet to provide protection against surges and spikes on the AC line.



Connecting The AC Power

7.0 Measuring The Power Supply Voltages

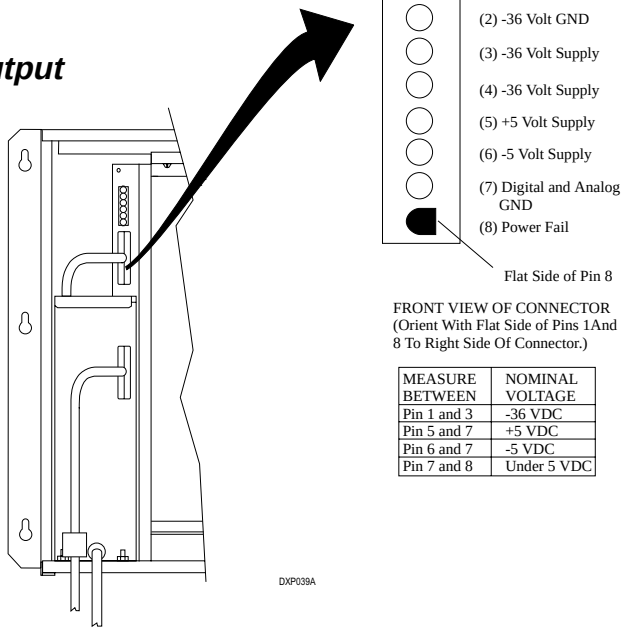
If needed, measure the power supply voltages at the connector end of the power cable with it disconnected from the cabinet backplane circuit board and the power supply turned on.



FRONT VIEW OF CONNECTOR (Orient With Flat Side of Pins 1And 8 To Right Side Of Connector.)

MEASURE BETWEEN	NOMINAL VOLTAGE
Pin 1 and 3	-36 VDC
Pin 5 and 7	+5 VDC
Pin 6 and 7	-5 VDC
Pin 7 and 8	Under 5 VDC

Measuring The Main Power Supply Output



FRONT VIEW OF CONNECTOR (Orient With Flat Side of Pins 1And 8 To Right Side Of Connector.)

MEASURE BETWEEN	NOMINAL VOLTAGE
Pin 1 and 3	-36 VDC
Pin 5 and 7	+5 VDC
Pin 6 and 7	-5 VDC
Pin 7 and 8	Under 5 VDC

Measuring The Expansion Power Supply Output

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Troubleshooting The DXPT1 Digital Carrier Transmission Option On The DXP Digital Communications System

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Referring To Other Documents

Installing The DXPT1 Digital Carrier Transmission Option, IMI89–214

Carrier-To-Customer Installation DS1 Metallic Interface, ANSI T1.403–1989

Private Branch Exchange (PBX) Switching Equipment for Voiceband Applications, 4.10 "Digital Signaling and Supervision", EIA/TIA–464A

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1 Defining The T1 Terms

Bipolar

A bipolar signal is composed of alternating pulses that both represent a digital logic 1. The positive pulse is a (+) and the negative pulse is a (-). Zero volts represents a space, or digital logic 0.

Bipolar Violation (or error)

A bipolar error is a digital logic 1 (or mark) that has the same polarity as its predecessor.

NOTE: Every time the system regenerates the signal stream, it corrects any bipolar errors; therefore, it prevents end-to-end error checking from using bipolar errors.

B8ZS (Binary Eight Zero Substitution)

This is a technique to send an all-zero channel without violating the ones-density requirement (a single one in each channel and no more than 15 zeros in a row). Voice transmission will not allow an all zero channel. The system accomplishes B8ZS suppression by inserting a special bipolar error that is interpreted, not as an error, but an all zero channel. The B8ZS feature replaces the all-zero channel two different ways. The feature replaces the all-zero channel with the sequence 000 + - 0 - + if the preceding pulse was a +, and the feature replaces the all-zero channel with the sequence 000 - + 0 + - if the preceding pulse was -. The + represents a positive pulse, the - represents a negative pulse, and 0 represents no pulse. Set the B8ZS feature with switches SW1–5 and SW1–6.

CAS (Channel Associated Signalling)

The Channel Associated Signalling is the only inbound signalling method currently supported by the DXPT1 board.

COFA (Change of Frame Alignment)

When switch SW2-6 is off, the green LED on the DXPT1 indicates whether the network source or the network span caused the last frame synchronization. (This indication disregards the first re-sync at cold start or a system reset —cold start and reset causes the network source to re-sync.) A COFA occurs if the network source does a re-sync. The COFA is a diagnostic tool that identifies the source of the loss of frame synchronization.

CPE/Carrier Equipment

The DXPT1 is normally classified as Customer Premise Equipment (CPE). If you use SW2–2 to configure the DXPT1 board to use the internal CSU while in the ESF mode, the network may require that the system be classified as Carrier Equipment (CE). The information packet that the DXPT1 board sends to the network contains a facility data link (FDL) maintenance message that has a bit in it that provides this identification.

CRC (Cyclic Redundancy Check)

A method of checking errors from the transmission source to the destination. For T1 operation, CRC caculates a checksum depending on the data in a frame. The system uses CRC in ESF mode exclusively. (You must enable CRC with DIP switch SW2-4).

Delay Dial E&M, DID Protocol Type

Once seized by a calling system, the system being called makes A=1 and B=1 until it is ready to receive digits. When it is ready to receive digits, it makes A=0 and B=0. The system uses a delay dial protocol when wink protocol timing is not compatible to the network.

Dial Pulse – T1

Dial pulse is a method of sending address digits (numbers) using A and B bits logic bits instead of sending DTMF tones. Some carriers may not support dial-pulse signalling. While the method is slower when compared with tones, it requires no DTMF receivers.

Direct Inward Dial (DID) T1 Trunk

DID is a protocol for inbound calls where the network sends the extension number during the beginning of the call. The system supports the 0 through 7 inbound digits. The network does not translate the digits to a valid extension—the system's DID translation tables perform this action.

DS-0 (Digital Signal-Level Zero)

Digital Signal-Level Zero is a single 64Kbit channel inside a T1 span.

E & M T1 Trunk

E&M is a signalling protocol that supports both inbound and outbound digits. Inbound digits from the network are already translated to a 3–digit or 4–digit valid extension. E & M is symmetrical from both ends and ignores the subscriber/office classification of other trunks. Use this signalling protocol for interconnecting two DXP Plus systems.

Extended Superframe Mode (ESF)

Extended Superframe Mode consists of 24 frames. The frame bit uses only 6 frames leaving 18 bits for other purposes. These spare 18 bits provide 6 bits for CRC information and 12 bits for a facility data link. The facility data link is for maintenance information (as defined by the ANSI T1.403 specification). Like the superframe mode, the 64–Kbit user channels have 24 frames available for use.

Ground Start T1 Trunks

Ground start is a call signalling protocol that monitors only outbound digits and supports disconnect supervision. Ground start protocol supports only the subscriber end of the communications link

FDL (Facility Data Link)

The Facility Data Link is a 4–Kbit communication link from the network to the DXPT1 board only when the board is operating in the ESF mode. The system sends preemptive messages (for example, yellow alarm and loopback), if needed, and sends error packets to the network once a second. The packets contain alarm history in accordance with the ANSI T1.403 specification.

Fractional T1

Fractional T1 is a T1 span where the user uses less than 24 channels. The DXPT1 board allocates eight or 16 channels to a fractional T1 but does not reallocate unused channels in the eight, 16, or 24 mode to other resources. A fractional T1 in ESF mode will nullify the CRC and other error checking capability since the network shares channels.

Immediate Start Protocol State

Once a calling system seizes a called system, the calling system sends address digits to the called system without requiring an acknowledgement. Inbound immediate start protocol does not support tone dial. Dial-pulse is adequate however. Immediate start protocol is applicable to DID and E&M tie lines.

Inband Signalling

A signalling method where the system sends overhead signalling along with channel traffic.

ISDN (Integrated Services Digital Network) Primary Rate (also called PRI)

Currently not offered by the DXPT1 board.

Loopback Local

An operation method that loops the DXPT1 board's transmit output and receive input paths. The loopback terminates all traffic and halts call processing. While in this idle condition, the system continues to transmit the T1 transmit stream to the network but it will not answer incoming calls. If the remote T1 equipment is the clock source (primary or secondary) for the DXOPT-SYN card, the remote equipment terminates the reference signal because the network receive circuit is open in local loopback. You initiate local loopback by setting the appropriate SW1 switches. The main purpose of local loopback is to verify the DXPT1 board's ability to synchronize properly. Loopback local operation is applicable to superframe adn extended superframe modes.

Loopback Payload

The loopback payload feature is an ESF-only method of loopback which loops the network receive input path to the remote T1 equipment's transmit output path. This loopback method does not loop the first bit of each frame to allow the DXPT1 board's facility data link to continue to transmit maintenance information. You can use switches SW2–7 and SW2–8 to manually initiate the payload loopback or you can allow the network to send an FDL message to initiate or restore the payload loopback. The DXPT1 board goes out-of-service during the loopback time.

Loopback Remote

The loopback remote feature loops the network receive input path to the remote T1 equipment's transmit output path. The remote loopback feature terminates all traffic and halt any call processing. You can use the SW2 switches to manually initiate remote loopback or you can allow the network to remotely initiate the condition. In superframe mode with SW2–1 set to on, the network can send a special in-band pattern (00010001000100010001.... min 5 seconds) to cause the DXPT1 board to automatically enter the remote loopback mode. The network can disable the loopback by sending a different in-band pattern (001001001001001001001.... min 5 seconds). In ESF mode, the DXPT1 board's facility data link, or maintenance channel, can enable and disable remote loopback automatically or you can set SW2–7 on and SW2–8 off to manually enable remote loopback or set both switches off to manually disable the feature. Loopback remote operation is applicable to superframd and extended superframe modes.

LIU Line Interface Unit

The line interface unit is the interface between the T1 copper wires and the DXPT1 board's framing circuitry. The LIU is responsible for separating the 1.544MHZ receive clock from the incoming stream and converting bipolar Alternate Mark Inversion (AMI) to 5–volt digital logic. The LIU also supports the automatic line build-out that regulates the transmit level according to the receive strength (LIU-2 switch).

Loop Start T1 Trunk

Loop Start T1 Trunk is a network protocol that monitors outbound digits to the DXPT1 board. This protocol does not support disconnect supervision. Loop start protocol supports the subscriber end of the communications path but does not support the office (network) end.

Primary Clock Reference

The straps on the DXAUX board designate the primary clock reference. Primary clock reference is the first choice reference clock used to synchronize the DXP Plus to the incoming span. If the system looses synchronization, it uses its secondary clock reference. If the secondary clock reference is not available, the DXOPT-SYN card's variable clock oscillator (VCO) switches to the fixed oscillator on the DXSRV (services) board. When it does this, slips occur.

Repeater

A repeater is a amplifying device that central office technicians place at approximately one mile intervals along a T1 circuit to boost the T1 signal. The T1 specifications allow a maximum of 50 repeaters along a communications path.

Slip

This term describes the condition that exists when the transmit 1.544 MHz clock is different from the receive 1.544 MHz clock. When the system collects or looses a frame of information due to the span frequencies being different, the system generates a slip error. Slip does not affect voice transmissions and may not affect modem traffic; however slip does effect digital data traffic. The DXPT1 board does not currently support digital data traffic. Also, at times a central office takes a T1 span out of service if too many slips occur—one or two a day is permissible (the carrier supplier will furnish you with an an exact number if you request that information from them).

Smart-Jack (Network Interface Box)

A smart jack is a demarcation box provided by the central office. A smart jack provides isolation and increased signal drive (up to one mile) and can respond to loopback commands for diagnostic purposes. The central office usually provides an 8–pin modular jack for T1 equipment connection. Pin 1 of the modular jack goes to pin 1 of the DXPT1 modular jack, and so on. Only pins 1 and 2 (DXPT1 receive), 4 and 5 (DXPT1 transmit) require connecting.

Superframe Mode (SF)

The standard T1 mode consists of 12 frames per superframe cycle. The first frame bit remains constant and rotates through a 12-bit pattern. By identifying the frame pattern, the system can select the sixth and twelfth frame for the AB bit signalling inband method. T1 parameters allow for 24 64–Kbit user channels.

Suppression

Suppression is a means to prevent more than 15 zeros in a row and not less than 1 pulse (mark) per channel. The DXPT1 board supports two suppression methods. These are the B7 method and the B8ZS method (selected by SW1–5 and SW1–6). The B7 method inserts a logic 1 in the seventh bit position of a channel if all bits are zeros. The B8ZS method inserts a bipolar violation that will be identified and stripped at the receiving end (selected by switches SW1–5, and SW1–6). Voice coding should not allow an all zero channel.

Unlock Alarm

On a normally operating DXPT1 board, the unlock alarm LED is always off. If this LED is on, it indicates that the phase lock loop creating the transmit 1.544 MHz frequency is defective. For this indicator to be meaningful, the DXOPT-SYN card must be synchronized (no red LEDs on). If the DXOPT-SYN card is not synchronized, you must correct that situation.

Wink E&M, DID Protocol State

This effect is a quick response by a called system (A=1, B=1) to a calling system that seized the line. The response indicates that the called system is ready to receive address digits.

Yellow Alarm

The yellow alarm indicates that the network has lost its incoming frame synchronization. The DXPT1 board signalling is inactive for approximately three to four seconds during this alarm time, and the system halts all call processing. If the system clears the received yellow alarm within the time limit, the DXPT1 board's inactive state terminates and call processing continues.

The system sends a yellow alarm to the network if it loses incoming frame synchronization or if the DXPT1 loses communications to the CPU board. Received and transmitted yellow alarms can not exist at the same time. If such a situation occurs, the system inhibits the transmitted alarm.

ZBTSI (Zero Byte Time Slot Interchange)

Zero Byte Time Slot Interchange is a complex technique to insure that the T1 transmission meets the pulse density requirement. This ZBTSI technique is unpopular in the telephone industy, and the DXPT1 board does not support the feature**.**



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1.1 Introducing The DXPT1

The DXPT1 is a digital interface board supporting up to 24 simultaneous calls on two pairs of wire. The advantages of T1 over single-channel systems are largely:

- Cost savings (much lower price per channel)
- Greater reliability
- Uses less copper wires
- Improved voice reproduction
- More features available

T1 is over 20 years old but the services have been upgraded during this time (for example, extended superframe).

T1 uses time division multiplexing techniques which multiplexes 24 channels in a stream. Each channel is 8 bits wide. The total is 24 channels x 8 bits = 192 bits for user information. An additional bit is added at the beginning of the stream to identify the particular frame. A frame every 125 msec or 8000/second. 12 frames make up a superframe for standard T1. ESF mode requires 24 frames per superframe. The frame bit in superframe mode is used 100% of the time. The sequence for the frame bits is:

100011011100. The first bit of each frame (frame bit) repeats over and over
| |
A B Of the 12 frames, the 6th and 12th contain the "A" and "B" signalling bits respectively.

The signalling is inband (mixed with the channel). For the two binary bits (A and B), only four combinations are possible (00, 01, 10, 11). These bits are assigned according to the signalling protocol (for example, E&M, DID, Loop Start, and Ground Start). See section 3, "Troubleshooting The Protocol Layer."

The span speed is 1.544 MHz (193 x 8000/sec).

For extended superframe (ESF), the frame-related bits in the 24 frames are:

ESF Framing Format
mcm0mcm0mcm1mcm0mcm1mcm1...6 frame bits (0 or 1) on frames 4, 8, 12, 16, 20, 24 (2 Kbps)
12 maintenance bits (m) (4 Kbps)
6 CRC error checking bits (c), if enabled (2 Kbps)

Therefore, all of the 24 non-user bits (frame, maintenance, and error checking) use a bandwidth of 8 Kbps out of the total bandwidth of 1.544 Mbps.

The A and B signalling bits are inserted over the least significant bits (LSB) of each channel in the 6th and 12th frame respectively. This does not change the speech encoding enough to be detected by the user. The A and B signalling bits are repeated in the 18th and 24th frames.

1.2 Describing The Channel Service Unit (CSU)

The DXPT1 board has a CSU built into the board. This allows direct connection to the network (DS1 level). If a CSU was not built-in, the connection would be DSX-1 and would only transmit 655 feet to the nearest 66-type connector block. The CSU increases signal drive to 1 mile, provides electrical isolation (1500 volts), and provides automatic line build out (ALBO). The output is set depending on the received signal level strength. When a strong signal is received, the transmit level is -15 dB. When a weak signal is received, the transmit level is 0 dB. This ability to adjust output levels prevents over driving a line repeater in the network, if directly connected. If a customer still wants to add an external CSU, he/she may do so. Normally, the DXPT1 is connected to a central office "smart" jack. The customer's savings from using the built-in CSU can easily amount to approximately one thousand dollars, at today's prices.

NOTE: If an external CSU is added by the installer for the purposes described above, and the mode is Extended Superframe, check the SW2-2 switch for the correct ID, if in conflict.

1.3 Considering Pre-Installation Details

CAUTION

For operation with the DXP, the T1 board must be Revision B or higher. If the T1 board that you are installing is a lower revision, contact Comdial Technical Services (1–800–366–8224) for advice before you proceed with the installation..

If you are the installer, you must consider the following things to ensure a proper installation.

A. Determine the T1 trunk configuration and communicate this to the central office and/or the network for coordination and assignment of service.

B. Determine whether the dial type is tone or pulse.

C. If DID or E&M protocols are going to be used, determine the number of DTMF receivers needed.

D. If the above protocols are used, coordinate the blocks of numbers assigned with the data base.

E. For DID and E & M protocols, determine the type. Wink start, delay dial, or immediate start are available. Wink start is very popular. If you choose immediate start inbound, select dial pulse over tone dial to ensure that the DXP has enough time to react.

F. AT&T will not supply dial tone unless the customer ordered this feature. However, if you enable the automatic route selection (ARS) feature, it will supply dial tone.

G. Configure an interface cable (8-conductor cable terminated with modular jacks) to connect to the DXPT1. See section 4 in *Installing The DXPT1 Digital Carrier Transmission Option,* IMI89–193 for more instructions. Pins 7 and 8 must be open at the DXP end for DXPT1 Issue 2 while Issue 3 boards and above will not require pins 7 and 8 to be open. A smart-jack often connects pins 7 and 8 to chassis ground. If the chassis ground is connected at the smart-jack, the DXP receive will most likely show loss of signal. (Pins 1 and 2 are shorted to 7 and 8 to allow for an inverted cable to be used.)

H. Order spare boards, if needed.

I. Make sure you have a synchronization card to install on the auxiliary board.

J. Determine the optimum DXPT1 board configuration. If a T1 board occupies a universal slot, more stations are possible than by using analog trunk boards.

K. If fractional T1 is being considered, decide whether 8-, 16-, or 24-channel mode is most beneficial.

L. Verify that primary lightning protection (such as gas discharge tubes) is provided where the T1 copper wires enter the building. This should be the case when a smart jack is installed by the central office. ***Primary protection is a must since the DXPT1 contains only secondary protection.***

M. For a DXP-to-DXP application, where no outside network exists, only one synchronization card is required. The designated “master” DXP does not require a synchronization card.

2 Troubleshooting The Physical Layer

SW1, SW2, and the LIU switches must be set up according to the customer's requirements. See *Installing The DXPT1 Digital Carrier Transmission Option*, IMI89–193 for directions.

2.1 Selecting Functions With DIP Switches SW1-1 Through SW1-8

NOTE: SW1 switch contents will be updated only during a reset operation.

The mode, superframe or extended superframe, is critical. If set wrong, the board will not find frame sync causing the red Sync LED to light.

Yellow alarm mode (SW1-4) is always off, unless the customer is in Japan.

Suppression is defaulted to B7. If digital data is ever presented to the DXPT1 board from a drop and insert multiplexer (mux), or any other means, B8ZS will be required even though the channel is disabled in the DXP. The digital data could be all zeros violating the ones density requirement of 1 in 8 bits in a channel. The network or mux must also have B8ZS enabled. If B8ZS is being sent in any channel the green LED above SW1 will flicker if SW2-6 is enabled. Do not set SW1-5 and SW1-6 to the "no suppression" setting unless approved by Comdial Engineering. The "no suppression" setting is for possible future needs.

SW1-7 and 8 are critical to the channel capacity required.

2.2 Selecting Functions With DIP Switches SW2-1 Through SW2-8

SW2-1 is valid only in the superframe mode. This switch must be "on" if the network is capable of initiating an inband loopback. The switch will not cause a remote loopback but it will look for the command from the network. Leaving the switch "on" does not hurt anything whether the network can perform the loopback operation or not. A reset is not required when changing the switch.

SW2-2 is programmed at reset in the ESF mode only, and it will always be "off" (default) unless the network requires the facility data link messages to be a different ID. The default is customer premise equipment. If the network requests that the messages have a carrier-type header ID, turn the switch "on" and reset the board. This will probably never need to be "on".

SW2-4 is for reporting CRC errors in the ESF mode, if the network has the ability to support the CRC feature. The default position is "off" to prevent false errors when the error checking is not supported by the network.

SW2-5 is to allow or prevent the sending of facility data link message packets in ESF mode during a preemptive yellow alarm and loopback messages. The ANSI specification allows FDL packets to be stopped during a yellow alarm and loopback, but some customers/networks want the packets to continue. Switch changes require a reset to be programmed.

SW2-6 defines the meaning of the green LED labeled "B8ZS/COFA." A reset is not required when changing this switch. When the switch is "off" (default), the LED indicates COFA detected. When the switch is "on," the LED indicates B8ZS detected. B8ZS detection is handy to verify if the network is sending B8ZS. If so, and the B8ZS suppression is not set (SW1-5, 6), the B8ZS will be seen as bipolar alarms, and recorded as such, even though they are not,

SW2-7, 8 are manual loopback requests for diagnostic reasons. Local loopback verifies the ability of the DXPT1 to sync on itself to insure frame syncing problems are not caused by the DXPT1 board. These switches are rarely used to enable remote loopback and payload loopback.

NOTE: A local loopback will disable the synchronization card reference causing an automatic switch to the next reference. If only one reference is configured, the system defaults to the DXP Plus fixed oscillator on the services board.

2.3 Selecting Functions With DIP Switches LIU-1 Through LIU-4

There are four LIU switches. The first switch will change the receive sensitivity from -26 dB to -36 dB. Changing to -36 dB for extra long loops (1 mile) is not recommended unless the DXPT1 will not maintain frame sync. In the -36 dB setting, noise could be a problem because of increased sensitivity.

The LIU-2 switch sets the transmit signal level. The transmit signal level has nothing to do with the audio voice levels. The default is manual “on” and the transmit level is determined by LIU-3 and 4 settings.

LIU-3 and LIU-4 are defaulted “off” which corresponds to 0 dB (strong signal).

For applications where the DXPT1 is directly connected to a nearby repeater, the automatic mode is preferred (LIU-2="off") to keep from over driving the repeater. Repeaters are very sensitive on their inputs. In auto mode, the transmit is determined by the receive level according to the following chart: LIU-3 and 4 are ignored in auto mode.

IF LEVEL RECEIVED IS	LEVEL TRANSMITTED IS
0 to -7.5 dB	-15 dB
-7.5 to -15 dB	-7.5 dB
-15 to -22.5 dB	-7.5 dB
-22.5 to -26 dB	0 dB

If in auto mode and LIU switch 3 or 4 is changed, a re-sync is required to reset the new setting. Unplugging the T1 span in and out is an easy way to cause a re-sync.

2.4 Setting Up The DXOPT-SYN Synchronization Card

Program the synchronization card by strapping the two strap blocks on the auxiliary board. A reference clock from each T1 board is presented. You can strap the board so that one T1 clock source is the primary clock reference, and another T1 source is the secondary clock reference. The secondary clock reference is then used in case the primary span fails. If only one T1 board is installed, we recommend that you strap the auxiliary board so that the one T1 source is serving as both the primary and secondary reference. Otherwise, don’t strap the secondary strapping block. See section 4, Installing The DXPT1 Digital Carrier Transmission Option, IMI89–214. The green LEDs on the sync card verifies the presence of a reference source. If the green LEDs are off, check the straps, and make sure that the DXPT1 board is not in the local loopback mode.

If one or more of the green LEDs are lit, the sync card’s red LED (Unlocked) should be off. Do not place the sync card’s switch in the manual mode during normal operation. The manual mode switch is for maintenance when you want to force the use of the primary or secondary reference. The automatic mode allows automatic selection of the secondary reference in the event that the primary reference is lost. If the sync card does not synchronize, and the green LEDs are lit, the synchronization card is probably bad. The only other possibility is that the sync card detection circuit on the services board is not working, which is unlikely. If the DXPT1 board is in an expansion cabinet, be sure the interface boards are multilayer (that is, not transparent). Earlier interface boards, of the non-multilayer type, are subject to electrical noise.

3 Troubleshooting The Protocol Layer

Four protocols are supported:

- E & M
- DID
- Ground Start
- Loop Start

Ground and loop start are subscriber-end only (DXP end) not office-end (network end).

Before starting protocol layer troubleshooting, make sure you have completed all physical layer troubleshooting to ensure that no alarms are occurring and that the DXPT1 board has no red LEDs lit except for the large status LED.

Troubleshooting the protocol layer consists of checking the A and B transmit and receive signalling bits. Depending on the protocol that is active and on which function is occurring, A and B signalling bits can be a digital one (“1") or a zero (”0"). In some cases, the level (“0" or ”1") doesn’t matter and could be either one (X). These levels are designated by a “0,” “1,” or “X” in the following tables.

When the function involves a user dialing a number with a rotary dial, the signalling bit designated by “DP” in the following tables, represents the dial pulse (make= 1 ; break = 0). For a ground start protocol, the signalling bit representing a dial pulse will be a digital one (“1") when a tone dial is used in place of a rotary dial.

NOTE: In the table below, an X is a don’t care. Signalling can be a 1 or 0. DP is a dial pulse (make = 1, break = 0).

3.1 Defining The Signalling Bits For The E & M Protocol

FUNCTION	TRANSMIT		RECEIVE		EIA/TIA 464-A STANDARD
	A	B	A	B	
OUTGOING CALL					
Idle	0	0	0	X	
DXP off-hook	1	1	0	X	
Wink	1	1	1	X	Wink on
Wink	1	1	0	X	Wink off
Dial pulsing	DP	DP	0	X	
Wait for ANS	1	1	0	X	
Far end ANSW	1	1	1	X	
INCOMING CALL					
Idle	0	0	0	X	
CO goes off-hook	0	0	1	X	
DXP sends wink	1	1	1	X	
DXP after wink	0	0	1	X	
Far end DP	0	0	DP	X	Make=1, Brk=0
Far end wait FR ANS	0	0	1	X	
DXP answers call	1	1	1	X	

3.2 Defining The Signalling Bits For The Direct Inward Dial (DID) Protocol

FUNCTION	TRANSMIT		RECEIVE		EIA/TIA 464-A STANDARD
	A	B	A	B	
INCOMING CALL					
Idle	0	0	0	X	
CO goes off-hook	0	0	0	X	
DXP sends wink	1	1	1	X	
DXP after wink	0	0	1	X	
Far end DP	0	0	DP	X	Make=1, Break=0
Far end wait FR ANS	0	0	1	X	
DXP answers call	1	1	1	X	

3.3 Defining The Signalling Bits For The Ground Start Protocol

FUNCTION	TRANSMIT		RECEIVE		EIA/TIA 464-A STANDARD
	A	B	A	B	
OUTGOING CALL					
Idle	0	1	1	X	
PBX grounds ring	0	0	1	X	
PBX grounds tip	0	0	0	X	
PBX removes ring ground	0	1	0	X	
PBX loop closed	1	1	0	X	
Dial pulsing	DP	1	0	X	“1" vs DP for DTMF
Dialing CMPL	1	1	0	X	
INCOMING CALL					
Idle	0	1	1	X	
CO grounds tip	0	1	0	1	
Ringing interval	0	1	0	0	
PBX presents call	0	1	0	1	
PBX answers call	1	1	0	X	
Normal talking STAT	1	1	0	X	
DISCONNECT PBX					
Talking state	1	1	0	X	
PBX opens loop	0	1	0	X	
CO removes tip ground	0	1	0	1	Idle state
CO ABANDONS INCOM...					
Talking State	1	1	0	X	
CO removes tip ground	0	1	0	1	CO hangs up
PBX opens loop	0	1	0	1	Idle state
PBX ABANDONS BEFORE CO HAS RETURNED TIP GROUND					
PBX waiting tip ground	0	0	1	X	
PBX removes ring ground	0	1	1	X	

3.4 Defining The Signalling Bits For The Loop Start Protocol

FUNCTION	TRANSMIT		RECEIVE		EIA/TIA 464-A STANDARD
	A	B	A	B	
OUTGOING CALL					
Idle	0	1	0	1	
PBX loop closed	1	1	0	1	Waiting for dial tone
PBX pulsing	DP	1	0	1	"1" vs DP for DTMF
Dialing CMPL	1	1	0	1	
INCOMING CALL					
Idle	0	1	0	1	
CO sends ring	0	1	0	0	
Interval between ring	0	1	0	1	
PBX presents call	0	1	0	1	
PBX answers call	1	1	0	X	
Normal talking STAT	1	1	0	X	
DISCONNECT PBX					
PBX opens loop	0	1	0	X	
Idle	0	1	0	1	
CO ABANDONS INCOM...					
CO applies ring	0	1	0	0	
Interval between ring	0	1	0	1	
CO abandons	0	1	0	1	
PBX stop presenting	0	1	0	1	

4 Using The Diagnostic Function

The diagnostic function on the DXPT1 board provides a method for obtaining information about the T1 operation. You can do this either on-site or from a remote location by sending and receiving coded messages. Remote operation is described in section 4.8.

4.1 Understanding The Diagnostic Switches And Indicators

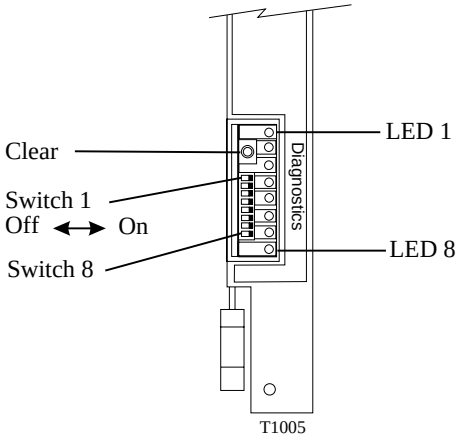
The diagnostic portion of the DXPT1 board contains eight DIP switches, eight green LEDs, and a "clear" pushbutton for clearing functions. Set the DIP switches to request certain T1 system information. When testing from a remote location, using a computer and modem, you can similate the switch settings by sending a coded message.

The system responds to your request for information by lighting certain LEDs to provide you with the requested information. If you are testing from a remote location, the system responds by sending a coded message that similates the lighted LEDs.

Use the clear pushbutton to stop any counting function (denoted by the LEDs sequencing) and reset the counter.

The diagnostic port is a monitor mode only access. You cannot cause harm to the equipment by moving the switches or pushing the clear pushbutton. Leaving any of the switches on will not cause any operational problems.

Since the operation is cryptic, the customer normally doesn't use the diagnostic monitor. Functions of the port are to simplify problem solving in the field



DXPT1 Diagnostic Switches And Indicators

4.1.1 Determining Channel Number

The letters ABCDE in switch positions 4 through 8 are used to designate a channel number in many of the tables used on the following pages. See the table below for the relationship between the letters ABCDE and channel numbers 1 through 24. (Example, a DIP switch setting of 10100101 requests trunk assignments on channel 6).

CHANNEL	A	B	C	D	E	CHANNEL	A	B	C	D	E	CHANNEL	A	B	C	D	E
1	OFF	OFF	OFF	OFF	OFF	9	OFF	ON	OFF	OFF	OFF	17	ON	OFF	OFF	OFF	OFF
2	OFF	OFF	OFF	OFF	ON	10	OFF	ON	OFF	OFF	ON	18	ON	OFF	OFF	OFF	ON
3	OFF	OFF	OFF	ON	OFF	11	OFF	ON	OFF	ON	OFF	19	ON	OFF	OFF	ON	OFF
4	OFF	OFF	OFF	ON	ON	12	OFF	ON	OFF	ON	ON	20	ON	OFF	OFF	ON	ON
5	OFF	OFF	ON	OFF	OFF	13	OFF	ON	ON	OFF	OFF	21	ON	OFF	ON	OFF	OFF
6	OFF	OFF	ON	OFF	ON	14	OFF	ON	ON	OFF	ON	22	ON	OFF	ON	OFF	ON
7	OFF	OFF	ON	ON	OFF	15	OFF	ON	ON	ON	OFF	23	ON	OFF	ON	ON	OFF
8	OFF	OFF	ON	ON	ON	16	OFF	ON	ON	ON	ON	24	ON	OFF	ON	ON	ON

4.2 Requesting Cold Start Information

When the DXP-T1 system is turned on, internal self-tests are run to determine the condition of the system. When you use this request, you are asking the system to provide you with the results of these tests. Upon making the cold start information request, the system verifies the following.

- operating mode is superframe (SF) or extended superframe (ESF),
- FDL daughterboard (used for ESF) is installed on the T1 board and okay or not installed (or defective),
- channel capacity currently selected is 8, 16, or 24 channels,
- static RAM is okay or has read/write errors,
- internal CPU RAM is okay or has read/write errors.

4.2.1 Setting The DIP Switches For Cold Start Information

Set the DIP switches as shown in the following table. Switch 1 is the top switch. When the switch is moved to the right, it is turned on. The hex code shown is used for remote operation only.

SWITCH SETTINGS								TYPE OF REQUEST	HEX CODE
1	2	3	4	5	6	7	8	Provide results of all self-tests run during system start-up (cold start).	E1
ON	ON	ON	OFF	OFF	OFF	OFF	ON		

4.2.2 Reading The Cold Start Information From The LEDs

The Table below shows the cold start information that is revealed by the LEDs. LED 1 is at the top.

LEDs								LED DEFINITIONS
1	2	3	4	5	6	7	8	
OFF								Not used
	OFF							SF mode
	ON							ESF mode
		OFF						Always off
			OFF					Either in SF mode or FDL board missing or bad
			ON					FDL board recognized (ESF only)
				OFF	OFF			Selected channel capacity is 24
				OFF	ON			Selected channel capacity is 8
				ON	OFF			Selected channel capacity is 16
						OFF		Static RAM has read/write errors
						ON		Static RAM is okay
							OFF	Internal CPU RAM has read/write errors
							ON	Internal CPU RAM is okay

Example: If you see the following LED light pattern, you can determine the cold start results from the above LED definitions. (For remote testing, the lFDL board recognized system would send hex code 53.)
m = LED off and | = LED on
m
| = ESF mode
m
| = FDL board recognized
m = 24-channel
m capacity
| = static RAM fully operational
| = internal CPU RAM fully operational

4.3 Requesting Information On Received Signal Strength

When you use this request, you are asking the system to provide the signal strength of its received signals. Upon making the received signal strength request, the system supplies you with the following information:

- the range in dB of the received signals.

4.3.1 Setting The DIP Switches For Received Signal Strength Information

Set the DIP switches as shown in the following table. Switch 1 is the top switch. When the switch is moved to the right, it is turned on. The hex code shown is used for remote operation only.

SWITCH SETTINGS								TYPE OF REQUEST	HEX CODE
1	2	3	4	5	6	7	8	Provide the dB range of the received signal strength.	FF
ON	ON	ON	ON	ON	ON	ON	ON		

4.3.2 Reading The Received Signal Strength Information From The LEDs

The Table below shows the received signal strength information that is revealed by the LEDs. LED 1 is at the top.

LEDs								LED DEFINITIONS	HEX CODE
1	2	3	4	5	6	7	8		
LEDs 1 through 4 not used (off)				OFF	OFF	OFF	ON	-7.5 to -15 dB (medium signal)	01
				OFF	OFF	ON	ON	-15 to -22.5 dB (weak signal)	03
				OFF	ON	ON	ON	-22 dB and below (spec is to -26 dB) (very weak)	07
				ON	ON	ON	ON	0 to - 7.5 dB (strong signal)	0F

NOTE: If signal is very weak from a long span of a mile or more, and frame synchronization is not being maintained, turn DIP switch LIU-1 on.

4.4 Requesting Information On Switch Settings

You can determine how particular DIP switches on the DXPT1 board are set by using one of the following requests. Depending on which request you make, the system supplies you with the following information:

- DIP switch settings for SW1,
- DIP switch settings for SW2,
- DIP switch settings for LIU.

4.4.1 Requesting Information On DIP Switch Settings

Set the diagnostic DIP switches as shown in the following table. Switch 1 is the top switch. When the switch is moved to the right, it is turned on. The hex code shown is used for remote operation only.

SWITCH SETTINGS								TYPE OF REQUEST	HEX CODE
1	2	3	4	5	6	7	8		
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	Provide the DIP switch settings for SW1	01
OFF	OFF	OFF	OFFO	OFF	OFF	ON	ON	Provide the DIP switch settings for SW1	03
OFF	OFF	OFF	OFF	OFF	ON	ON	ON	Provide the DIP switch settings for LIU	07
OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	Provide the DIP switch settings for the diagnostic switches (the diagnostic LEDs simply “mirror” the switch settings; that is, LEDs 5 and 8 should be lit).	09

4.4.2 Reading The DIP Switch Settings Information From The LEDs

The diagnostic LEDs “mirror” the switch settings for the DIP switches requested. For example, if LED 1 is on, then switch 1 is on for the requested DIP switches. If LED 1 is off, then switch 1 is off, and so forth.

When requesting information on the LIU DIP switch settings, the system replies via LEDs 1 through 4. LEDs 5 through 8 are not used in this application.

4.5 Requesting AB Signalling

When you use this request, you are asking the system to reveal the A and B bits. Upon making the AB signalling request, the system supplies you with the following information:

- A bit transmitted to the CO,
- B bit transmitted to the CO,
- A bit received from the CO,
- B bit received from the CO.

4.5.1 Setting The DIP Switches To Request AB Signalling

Set the DIP switches as shown in the following table. Switch 1 is the top switch. When the switch is moved to the right, it is turned on. Use switches 4 through 8 (designated in the table by A through E) to select the channel you want to test (1 through 24). See the table in section 4.1.1 for the relationship between the 24 different letter groups and channel numbers. For remote operation, determine the corresponding hex code from Table 1.

SWITCH SETTINGS								TYPE OF REQUEST	HEX CODE
1	2	3	4	5	6	7	8		
OFF	OFF	ON	A	B	C	D	E	Provide AB signalling on the channel designated by ABCDE. See section 4.1.1.	see Table 1

4.5.2 Reading The AB Signalling Information From The LEDs

The Table below shows samples of the AB signalling information that is revealed by the LEDs. LEDs 5 through 8 are off. LED 1 is at the top.

LEDs								LED DEFINITIONS	HEX CODE
1	2	3	4	5	6	7	8		
ON	OFF	OFF	OFF	LEDs 5-8 are off				Transmitting A bit to central office	80
OFF	ON	OFF	OFF					Transmitting B bit to central office	40
OFF	OFF	ON	OFF					Receiving A bit from central office	20
OFF	OFF	OFF	ON					Receiving B bit from central office	10

4.6 Requesting Information On Trunk Assignments

Make this request to receive information on the trunk assignments that have been made. Upon making this request, the system provides you with the following information:

- trunk type (ground start, DID, E&M, or loop start),
- dial type (rotary or tone),
- signalling protocol (immediate, wink, delay).

4.6.1 Setting The DIP Switches For Requesting Trunk Assignment Information

Set the DIP switches as shown in the following table to request trunk assignment information. Use switches 4 through 8 (designated in the table by A through E) to select the channel you want to test (1 through 24). See the table in section 4.1.1 for the relationship between the 24 different letter groups and channel numbers. For remote operation, determine the corresponding hex code from Table 1. Switch 1 is the top switch.

SWITCH SETTINGS								TYPE OF REQUEST	HEX CODE
1	2	3	4	5	6	7	8	Provide information about trunk assignments on the channel specified by the letters ABCDE (see the table in section 4.1.1).	see Table 1
ON	OFF	ON	A	B	C	D	E		

4.6.2 Reading The Trunk Assignment Information From The LEDs

The Table below shows the trunk assignment information that is revealed by the LEDs. LED 1 is at the top.

LEDs								LED DEFINITIONS
1	2	3	4	5	6	7	8	
ON	OFF	OFF	OFF					Ground start
ON	ON	OFF	OFF					DID
OFF	ON	OFF	OFF					E&M
OFF	OFF	ON	OFF					Loop start
				ON				Tone dial
					OFF			Not used
						OFF	OFF	Wink start
						OFF	ON	Delay start
						ON	OFF	Immediate start
						ON	ON	Not used
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	No trunk assignments made

4.7 Requesting Information About Channel State

Use this request to determine the state of the channel specified in the request command. Upon making this request, the system provides you with the following information:

- channel state (idle or busy).

4.7.1 Setting The DIP Switches For Requesting Channel State Information

Set the DIP switches as shown in the following table to request the state of the channel specified in the request command. Use switches 4 through 8 (designated in the table by A through E) to select the desired channel.(1 through 24). See the table in section 4.1.1 for the relationship between the 24 different letter groups and channel numbers. For remote operation, determine the corresponding hex code from Table 1. Switch 1 is the top switch.

SWITCH SETTINGS								TYPE OF REQUEST	HEX CODE
1	2	3	4	5	6	7	8	Provide information about the state of the channel specified by the letters ABCDE (see the table in section 4.1.1).	see Table 1
ON	ON	OFF	A	B	C	D	E		

4.7.2 Reading The Channel State Information From The LEDs

The Table below shows the channel state information that is revealed by the LEDs. LED 1 is at the top.

LEDs								LED DEFINITIONS	HEX CODE
1	2	3	4	5	6	7	8		
OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	The selected channel is in the idle state.	03

4.8 Using The Hexadecimal Codes For Remote Diagnostics

You can similate the diagnostic DIP switch settings, that are usually made on-site, by sending the following code sequence via modem to the remote DXPT1 board:

tkmsg<space>(valid port number)<space>7B,(hex code)

The hexadecimal value that you use for the field code corresponds to a bit pattern that you are using to similate DIP switch settings. For example, to similate a switch setting of 11100001 (switches 1, 2, 3, and 8 on) use hex code E1 in the field position. (Switch 1 is the top switch as you look at the front edge of the DXPT1 board. The switches are “on” when you move them to the right.).

After you have interrogated the DXPT1 board by transmitting a valid diagnostic code to it, the DXPT1 responds with a hex code that similarily represents a bit pattern that you can find in Table 1. This bit pattern represents the diagnostic LEDs located adjacent to the DIP switches on the DXPT1 board. For example, let’s assume you received the hex code 53 in response to a request for cold start information. Since 53 (hex) represents a bit pattern of 01010011, it follows that LEDs 2, 4, 7, and 8 are lit. (LED 1 is the top LED in the group of eight on the DXPT1 board.) See the example in section 4.2.2.

Table 1. Hexadecimal Codes Related To Bit Patterns

Bit Pattern	Hex Code	Bit Pattern	Hex Code	Bit Pattern	Hex Code	Bit Pattern	Hex Code
1 2 3 4 5 6 7 8		1 2 3 4 5 6 7 8		1 2 3 4 5 6 7 8		1 2 3 4 5 6 7 8	
0 0 0 0 0 0 0 0	00	0 1 0 0 0 0 0 0	40	1 0 0 0 0 0 0 0	80	1 1 0 0 0 0 0 0	C0
0 0 0 0 0 0 0 1	01	0 1 0 0 0 0 0 1	41	1 0 0 0 0 0 0 1	81	1 1 0 0 0 0 0 1	C1
0 0 0 0 0 0 1 0	02	0 1 0 0 0 0 1 0	42	1 0 0 0 0 0 1 0	82	1 1 0 0 0 0 1 0	C2
0 0 0 0 0 0 1 1	03	0 1 0 0 0 0 1 1	43	1 0 0 0 0 0 1 1	83	1 1 0 0 0 0 1 1	C3
0 0 0 0 0 1 0 0	04	0 1 0 0 0 1 0 0	44	1 0 0 0 0 1 0 0	84	1 1 0 0 0 1 0 0	C4
0 0 0 0 0 1 0 1	05	0 1 0 0 0 1 0 1	45	1 0 0 0 0 1 0 1	85	1 1 0 0 0 1 0 1	C5
0 0 0 0 0 1 1 0	06	0 1 0 0 0 1 1 0	46	1 0 0 0 0 1 1 0	86	1 1 0 0 0 1 1 0	C6
0 0 0 0 0 1 1 1	07	0 1 0 0 0 1 1 1	47	1 0 0 0 0 1 1 1	87	1 1 0 0 0 1 1 1	C7
0 0 0 0 1 0 0 0	08	0 1 0 0 1 0 0 0	48	1 0 0 0 1 0 0 0	88	1 1 0 0 1 0 0 0	C8
0 0 0 0 1 0 0 1	09	0 1 0 0 1 0 0 1	49	1 0 0 0 1 0 0 1	89	1 1 0 0 1 0 0 1	C9
0 0 0 0 1 0 1 0	0A	0 1 0 0 1 0 1 0	4A	1 0 0 0 1 0 1 0	8A	1 1 0 0 1 0 1 0	CA
0 0 0 0 1 0 1 1	0B	0 1 0 0 1 0 1 1	4B	1 0 0 0 1 0 1 1	8B	1 1 0 0 1 0 1 1	CB
0 0 0 0 1 1 0 0	0C	0 1 0 0 1 1 0 0	4C	1 0 0 0 1 1 0 0	8C	1 1 0 0 1 1 0 0	CC
0 0 0 0 1 1 0 1	0D	0 1 0 0 1 1 0 1	4D	1 0 0 0 1 1 0 1	8D	1 1 0 0 1 1 0 1	CD
0 0 0 0 1 1 1 0	0E	0 1 0 0 1 1 1 0	4E	1 0 0 0 1 1 1 0	8E	1 1 0 0 1 1 1 0	CE
0 0 0 0 1 1 1 1	0F	0 1 0 0 1 1 1 1	4F	1 0 0 0 1 1 1 1	8F	1 1 0 0 1 1 1 1	CF
0 0 0 1 0 0 0 0	10	0 1 0 1 0 0 0 0	50	1 0 0 1 0 0 0 0	90	1 1 0 1 0 0 0 0	D0
0 0 0 1 0 0 0 1	11	0 1 0 1 0 0 0 1	51	1 0 0 1 0 0 0 1	91	1 1 0 1 0 0 0 1	D1
0 0 0 1 0 0 1 0	12	0 1 0 1 0 0 1 0	52	1 0 0 1 0 0 1 0	92	1 1 0 1 0 0 1 0	D2
0 0 0 1 0 0 1 1	13	0 1 0 1 0 0 1 1	53	1 0 0 1 0 0 1 1	93	1 1 0 1 0 0 1 1	D3
0 0 0 1 0 1 0 0	14	0 1 0 1 0 1 0 0	54	1 0 0 1 0 1 0 0	94	1 1 0 1 0 1 0 0	D4
0 0 0 1 0 1 0 1	15	0 1 0 1 0 1 0 1	55	1 0 0 1 0 1 0 1	95	1 1 0 1 0 1 0 1	D5
0 0 0 1 0 1 1 0	16	0 1 0 1 0 1 1 0	56	1 0 0 1 0 1 1 0	96	1 1 0 1 0 1 1 0	D6
0 0 0 1 0 1 1 1	17	0 1 0 1 0 1 1 1	57	1 0 0 1 0 1 1 1	97	1 1 0 1 0 1 1 1	D7
0 0 0 1 1 0 0 0	18	0 1 0 1 1 0 0 0	58	1 0 0 1 1 0 0 0	98	1 1 0 1 1 0 0 0	D8
0 0 0 1 1 0 0 1	19	0 1 0 1 1 0 0 1	59	1 0 0 1 1 0 0 1	99	1 1 0 1 1 0 0 1	D9
0 0 0 1 1 0 1 0	1A	0 1 0 1 1 0 1 0	5A	1 0 0 1 1 0 1 0	9A	1 1 0 1 1 0 1 0	DA
0 0 0 1 1 0 1 1	1B	0 1 0 1 1 0 1 1	5B	1 0 0 1 1 0 1 1	9B	1 1 0 1 1 0 1 1	DB
0 0 0 1 1 1 0 0	1C	0 1 0 1 1 1 0 0	5C	1 0 0 1 1 1 0 0	9C	1 1 0 1 1 1 0 0	DC
0 0 0 1 1 1 0 1	1D	0 1 0 1 1 1 0 1	5D	1 0 0 1 1 1 0 1	9D	1 1 0 1 1 1 0 1	DD
0 0 0 1 1 1 1 0	1E	0 1 0 1 1 1 1 0	5E	1 0 0 1 1 1 1 0	9E	1 1 0 1 1 1 1 0	DE
0 0 0 1 1 1 1 1	1F	0 1 0 1 1 1 1 1	5F	1 0 0 1 1 1 1 1	9F	1 1 0 1 1 1 1 1	DF
0 0 1 0 0 0 0 0	20	0 1 1 0 0 0 0 0	60	1 0 1 0 0 0 0 0	A0	1 1 1 0 0 0 0 0	E0
0 0 1 0 0 0 0 1	21	0 1 1 0 0 0 0 1	61	1 0 1 0 0 0 0 1	A1	1 1 1 0 0 0 0 1	E1
0 0 1 0 0 0 1 0	22	0 1 1 0 0 0 1 0	62	1 0 1 0 0 0 1 0	A2	1 1 1 0 0 0 1 0	E2
0 0 1 0 0 0 1 1	23	0 1 1 0 0 0 1 1	63	1 0 1 0 0 0 1 1	A3	1 1 1 0 0 0 1 1	E3
0 0 1 0 0 1 0 0	24	0 1 1 0 0 1 0 0	64	1 0 1 0 0 1 0 0	A4	1 1 1 0 0 1 0 0	E4
0 0 1 0 0 1 0 1	25	0 1 1 0 0 1 0 1	65	1 0 1 0 0 1 0 1	A5	1 1 1 0 0 1 0 1	E5
0 0 1 0 0 1 1 0	26	0 1 1 0 0 1 1 0	66	1 0 1 0 0 1 1 0	A6	1 1 1 0 0 1 1 0	E6
0 0 1 0 0 1 1 1	27	0 1 1 0 0 1 1 1	67	1 0 1 0 0 1 1 1	A7	1 1 1 0 0 1 1 1	E7
0 0 1 0 1 0 0 0	28	0 1 1 0 1 0 0 0	68	1 0 1 0 1 0 0 0	A8	1 1 1 0 1 0 0 0	E8
0 0 1 0 1 0 0 1	29	0 1 1 0 1 0 0 1	69	1 0 1 0 1 0 0 1	A9	1 1 1 0 1 0 0 1	E9
0 0 1 0 1 0 1 0	2A	0 1 1 0 1 0 1 0	6A	1 0 1 0 1 0 1 0	AA	1 1 1 0 1 0 1 0	EA
0 0 1 0 1 0 1 1	2B	0 1 1 0 1 0 1 1	6B	1 0 1 0 1 0 1 1	AB	1 1 1 0 1 0 1 1	EB
0 0 1 0 1 1 0 0	2C	0 1 1 0 1 1 0 0	6C	1 0 1 0 1 1 0 0	AC	1 1 1 0 1 1 0 0	EC
0 0 1 0 1 1 0 1	2D	0 1 1 0 1 1 0 1	6D	1 0 1 0 1 1 0 1	AD	1 1 1 0 1 1 0 1	ED
0 0 1 0 1 1 1 0	2E	0 1 1 0 1 1 1 0	6E	1 0 1 0 1 1 1 0	AE	1 1 1 0 1 1 1 0	EE
0 0 1 0 1 1 1 1	2F	0 1 1 0 1 1 1 1	6F	1 0 1 0 1 1 1 1	AF	1 1 1 0 1 1 1 1	EF
0 0 1 1 0 0 0 0	30	0 1 1 1 0 0 0 0	70	1 0 1 1 0 0 0 0	B0	1 1 1 1 0 0 0 0	F0
0 0 1 1 0 0 0 1	31	0 1 1 1 0 0 0 1	71	1 0 1 1 0 0 0 1	B1	1 1 1 1 0 0 0 1	F1
0 0 1 1 0 0 1 0	32	0 1 1 1 0 0 1 0	72	1 0 1 1 0 0 1 0	B2	1 1 1 1 0 0 1 0	F2
0 0 1 1 0 0 1 1	33	0 1 1 1 0 0 1 1	73	1 0 1 1 0 0 1 1	B3	1 1 1 1 0 0 1 1	F3
0 0 1 1 0 1 0 0	34	0 1 1 1 0 1 0 0	74	1 0 1 1 0 1 0 0	B4	1 1 1 1 0 1 0 0	F4
0 0 1 1 0 1 0 1	35	0 1 1 1 0 1 0 1	75	1 0 1 1 0 1 0 1	B5	1 1 1 1 0 1 0 1	F5
0 0 1 1 0 1 1 0	36	0 1 1 1 0 1 1 0	76	1 0 1 1 0 1 1 0	B6	1 1 1 1 0 1 1 0	F6
0 0 1 1 0 1 1 1	37	0 1 1 1 0 1 1 1	77	1 0 1 1 0 1 1 1	B7	1 1 1 1 0 1 1 1	F7
0 0 1 1 1 0 0 0	38	0 1 1 1 1 0 0 0	78	1 0 1 1 1 0 0 0	B8	1 1 1 1 1 0 0 0	F8
0 0 1 1 1 0 0 1	39	0 1 1 1 1 0 0 1	79	1 0 1 1 1 0 0 1	B9	1 1 1 1 1 0 0 1	F9
0 0 1 1 1 0 1 0	3A	0 1 1 1 1 0 1 0	7A	1 0 1 1 1 0 1 0	BA	1 1 1 1 1 0 1 0	FA
0 0 1 1 1 0 1 1	3B	0 1 1 1 1 0 1 1	7B	1 0 1 1 1 0 1 1	BB	1 1 1 1 1 0 1 1	FB
0 0 1 1 1 1 0 0	3C	0 1 1 1 1 1 0 0	7C	1 0 1 1 1 1 0 0	BC	1 1 1 1 1 1 0 0	FC
0 0 1 1 1 1 0 1	3D	0 1 1 1 1 1 0 1	7D	1 0 1 1 1 1 0 1	BD	1 1 1 1 1 1 0 1	FD
0 0 1 1 1 1 1 0	3E	0 1 1 1 1 1 1 0	7E	1 0 1 1 1 1 1 0	BE	1 1 1 1 1 1 1 0	FE
0 0 1 1 1 1 1 1	3F	0 1 1 1 1 1 1 1	7F	1 0 1 1 1 1 1 1	BF	1 1 1 1 1 1 1 1	FF

5 Selecting The T1 PAD Settings

The system pad settings that you select through the DXP *Plus* system programming are very important for the correct audio level to be transmitted and received and for echo suppression.

5.1 Setting T1 Transmit Level

For the older software, set to *normal* (uses low, very-low, normal, high, very-high settings). For software using Gain1, Gain2, Nominal, Loss1, Loss2, Loss3, Loss4, and Loss5, use *Nominal* setting.

5.2 Setting T1 Receive Level

For the older software, set to Very-Low. For the Loss/Gain software, set to Loss4. If echo problems occur, try Loss5.

6 Solving T1 Problems

See the following table for T1 problems you could encounter and their possible causes.

PROBLEM	POSSIBLE CAUSE
Signalling bits are not being received properly (no seize) or the network is not "seeing" the seize.	Associated multiplexer (mux) equipment may be defective if installed between the DXP and the central office (CO).
When the T1 option is installed in a DXP system, the DXP shows massive seizes on the inbound channels.	Incorrect trunk assignments. For example, ground start idle bits will cause seizes on DID and E&M trunk assignments.
The DXPT1 is seizing outward A=1 and B=1 and channel is in the idle state.	Channel not assigned and not disabled. All LEDs will be off upon making a request for trunk assignment information (see section 4.6.2).
The SIG red LED on the DXPT1 board is lit indicating no receive signal.	- If new install, cabling may be reversed. - Wiring to DXPT1 board may be defective - DXPT1 board may be defective. Verify by installing local loopback.
Bipolar alarms are indicated when T1 option is first installed.	- Only one receive wire connected. Check cable. - Noise sources or lightning.
The SLIP red LED on the DXPT1 board is lit indicating frame slips are occurring.	DXOPT-SYN card may not be locked. There should not be any red LEDs on this card lit. Verify presence of primary or secondary sources by the green LEDs lit on this card.
Echos are heard.	- Two- to four-wire hybrid conversions have been made. Cut in echo suppressors to eliminate echos on calls over 600 miles and inform the network. - Pad setting may be incorrect causing acoustical feedback (see section 5, PAD Settings). 0 dB (or -3 dB) is recommended for transmitted data and -9 dB at an industry standard telephone (IST).

A. Appendix A

Appendix A consists of two tables showing superframe and extended superframe format. The information for these tables is from the American National Standards Institute (ANSI) specification T1.403-1989.

Table 2. Superframe Format

Frame Number	F Bits			Bit Use In Each Time Slot		Signalling Bit Use Options	
	Bit Number	Term Frame (F_1)	Signal Frame (F_2)	Traffic	Signal	Signalling	Channel
1	0	1	—	1-8	—	—	—
2	193	—	0	1-8	—	—	—
3	386	0	—	1-8	—	—	—
4	579	—	0	1-8	—	—	—
5	772	1	—	1-8	—	—	—
6	965	—	1	1-7	8	—	A
7	1158	0	—	1-8	—	—	—
8	1351	—	1	1-8	—	—	—
9	1544	1	—	1-8	—	—	—
10	1737	—	1	1-8	—	—	—
11	1930	0	—	1-8	—	—	—
12	2123	—	0	1-7	8	—	B

NOTES:

(1) Frame 1 transmitted first.

(2) Frames 6 and 12 are denoted signalling frames.

(3) Option T- Traffic (bit 8 not used for robbed-bit signalling).

Table 3. Extended Superframe Format

Frame Number	F Bits				Bit Use In Each Time Slot			Signalling Bit Use Options		
	Bit Number	FPS	DL	CRC	Traffic	Signal	T	2	4	16
1	0	—	m	—	1-8	—	—	—	—	—
2	193	—	—	C_1	1-8	—	—	—	—	—
3	386	—	m	—	1-8	—	—	—	—	—
4	579	0	—	—	1-8	—	—	—	—	—
5	772	—	m	—	1-8	—	—	—	—	—
6	965	—	—	C_2	1-7	8	—	A	A	A
7	1158	—	m	—	1-8	—	—	—	—	—
8	1351	0	—	—	1-8	—	—	—	—	—
9	1544	—	m	—	1-8	—	—	—	—	—
10	1737	—	—	C_3	1-8	—	—	—	—	—
11	1930	—	m	—	1-8	—	—	—	—	—
12	2123	1	—	—	1-7	8	—	A	B	B
13	2316	—	m	—	1-8	—	—	—	—	—
14	2509	—	—	C_4	1-8	—	—	—	—	—
15	2702	—	m	—	1-8	—	—	—	—	—
16	2895	0	—	—	1-8	—	—	—	—	—
17	3088	—	m	—	1-8	—	—	—	—	—
18	3281	—	—	C_5	1-7	8	—	A	A	C
19	3474	—	m	—	1-8	—	—	—	—	—
20	3667	1	—	—	1-8	—	—	—	—	—
21	3860	—	m	—	1-8	—	—	—	—	—
22	4053	—	—	C_6	1-8	—	—	—	—	—
23	4246	—	m	—	1-8	—	—	—	—	—
24	4439	1	—	—	1-7	8	—	A	B	D

NOTES:

(1) Frame 1 transmitted first.

(2) Frames 6, 12, 18, and 24 are denoted signalling frames.

(3) FPS = Framing Pattern Sequence (...001011...)

(4) DL = 4KBits/s Data Link (Message Bits m)

(5) CRC - CRC6 Cyclic Redundancy Check (Bits C1-C6)

(6) Option T = Traffic (Bit 8 not used for Robbed-Bit signalling)

(7) Option 2 = 2-State signalling (Channel A)

(8) Option 4 = 4-State signalling (Channels A and B)

(9) Option 16 = 16-State signalling (Channels A, B, C, and D)

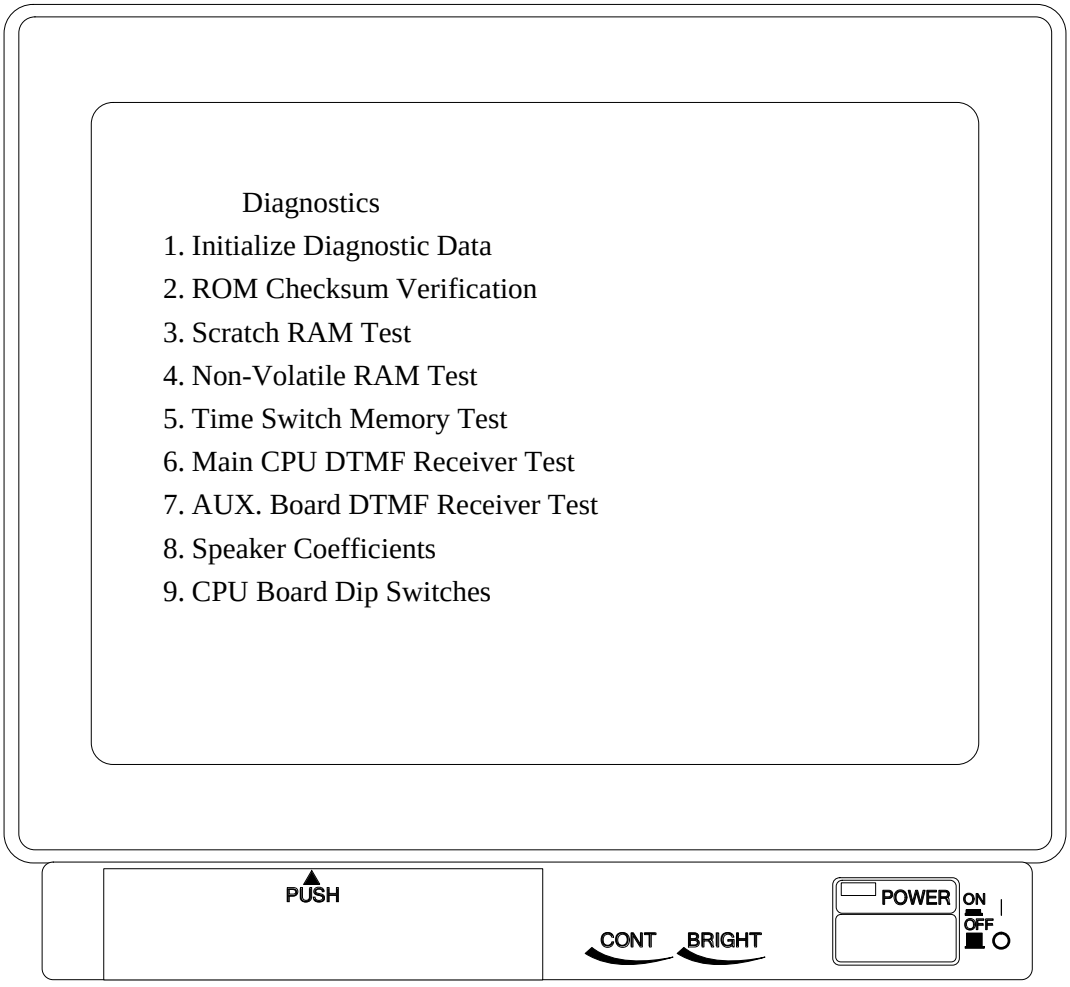

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Understanding The System Diagnostics

1.0 Introducing System Diagnostics

The DXP provides you with the option of doing several different types of diagnostic checks on the system. This chapter details the types of diagnostics and their functions.

NOTE: You should perform all diagnostic tests on an idle system and under the direction of a Comdial technician. A busy system could produce invalid test results. Because there are numerous items that could contribute to a failure of any of these tests, Comdial assistance is required in interpreting the results of the diagnostic tests.



Viewing The Diagnostics Screen

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2.0 Defining System Diagnostics

2.1 Initialize Diagnostic Data

This option clears all previous diagnostic test results from memory.

2,2 ROM Checksum Verification

The ROM checksum test calculates and displays a checksum to test the integrity of the system software EPROMs.

2.3 Scratch RAM Test

This test checks the integrity of the scratch RAM area by writing and reading words in memory. The test works by writing a known pattern, “55AA” into memory and then reading the area of memory back. The system then writes and reads a second known pattern, “AA55.” This algorithm checks every byte in the the scratch RAM area. If an error occurs, the system displays a message stating that the test failed. Scratch RAM is considered the working area of memory for the DXP’s microprocessor. This area of memory is “volatile,” which means that any data in this area is lost when the system loses power.

2.4 NonVolatile RAM test

This test checks the integrity of the NOV-RAM area of memory. The NOV-RAM area of memory is write protected and backed up by super capacitors on the DXP’s RAM memory board. The programmed database and SMDRs are stored in this area of memory. This test uses the same write/read algorithm as the scratch RAM employs.

2.5 Time Switch Memory Test

This test checks all 256 timeslots with a write/read algorithm pattern similar to that of the scratch/NOV-RAM test. All voice and tones into and out of the DXP pass through the timeswitch.

2.6 Main CPU DTMF Receiver Test

This diagnostic test checks the two main DTMF receivers on the CPU board for functionality. It performs its check by connecting DTMF tones 0-9, *, and # through the timeswitch and confirming that the correct tone was recognized by the receiver. If an error occurs, the system displays a message stating which receiver failed.

2.7 AUX Board DTMF Receiver Test

This diagnostic test checks all of the DTMF receivers on the installed auxiliary boards. The same functional DTMF tone check is performed as for the two main DTMF receivers. If an error occurs, the system displays a message stating which DTMF receiver on which DTMF tone card and which AUX board has failed.

2.8 Speaker Coefficients

Certain models of Comdial digital telephones have performance characteristics that can be modified by using this section of diagnostics. Do not attempt to modify any of the values found in this section unless you have been directed to do so by a Comdial technician; doing so could severely impact the performance of the associated telephone. Once modified, these values remain in the telephone's permanent memory and are not affected by a DXP master clear.

2.9 CPU Board and DIP Switches

This section displays the current settings of the eight DIP switches on the DXP CPU board. This screen updates simultaneously as the switches are changed. This diagnostic is useful for determining the status of the switches from a remote location.

The current switches used are as follows:

Switch 1—Fixes serial port baud rates to known values

Switch 7—Initializes DXP Modem—sets auto answer, for example. Switch should always be on to ensure that the DXP will re-initialize the modem after a loss of power or reset.

	Baud In	Baud Out	Data Bits	Stop Bits	Parity	Flow Ctrl..
Port 1	9600	9600	8	1	None	None
Port 2	300	300	7	2	None	None

Switch 8—Used for DXP software upgrades. Automatically performs a master clear when a different revision of software is detected upon power up. If the software is changed to a different revision and this switch is not "on," the system won't run.

DXP

Digital Communications System

Video Display Terminal Programming Instructions

The procedures included in this publication reflect software releases through 9A.

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1 Understanding General Programming Information

It is best that you program the DXP digital communications system from a video display terminal (VDT) that supports the ANSI standard escape sequences for cursor and video control. The VDT must be a serial-data, RS-232 type, asynchronous device. The DXP system supports ANSI standard, ANSI color, and WYSE 50 terminals with full screen editing of database information. Other types of terminals use a line-by-line editing approach instead of a full screen editing approach and make programming harder to do.

You can employ a personal computer (PC) if it will run a communications software program that allows it to emulate a data terminal device (DTE equipment). Many communications software programs are available for this purpose. One such program that works effectively is known as PROCOMM produced by Datastorm Technologies; however, you can use any that match the following data communications parameters:

- full duplex,
- XMODEM communication protocol (8 bit data required).

Regardless of the type of programming terminal that you employ, connect it to the common equipment data port per the discussion found in IMI66-085, *Installation Instructions For The DXP Digital Communications System Main Cabinet Assembly*.

You can program the DXP digital communications system remotely using the following equipment:

- a VDT or a PC and appropriate software program,
- a pair of data modems (one for your terminal and one for the remote site).

Refer to *GCA40-075, Feature Applications For The DXP Digital Communications System*, for complete remote programming details.

It is possible for you to mismatch the data configurations of your programming terminal (VDT) with those of the DXP and prevent data communications from occurring. You can reconfigure your VDT until you match the data parameters of the DXP; however, the DXCPU-68K board provides a DIP switch that changes the DXP data configuration to a fixed set of parameters. You can match your VDT to this fixed set of parameters and eliminate any configuration guess work. When you set DIP switch 1 to its ON position, you fix the DXP serial data ports to the following parameters:

Parameter	Data Port A	Data Port B
Baud Rate In	9600	300
Baud Rate Out	9600	300
Data Bits	8	7
Stop Bits	1	2
Parity Bits	None	None
Flow control	None	None

When you set the DIP switch to OFF, you can program the DXP data port configuration parameters using the procedure detailed in Section 6.5*, Serial Ports.*

2 Reviewing General Programming Considerations

Since the programming procedure is menu driven, you should consider all of the following points.

- The menu presents a list of selections for your consideration. Each selection differs in content and requires a different response.
- When you respond to each selection, it either causes the system to present a further breakdown of selections or causes a particular programming action to take place.
- Menu lines prompt you for the required response and, where appropriate, will repeat prompts to allow programming of more than one device without you having to make another menu selection.
- All of the menus operate in a similar manner. They differ in only the required response that you must make.
- Some menus contain more than one page. On these menus, you can press and hold the CONTROL key while you type the *N* key to display the next page (or type *P* to display the previous page).
- Each prompt requires a response followed by a Carriage Return (RETURN). A more common label for this control on most PC keyboards is ENTER.
- Most menu responses usually consists of a one-, two-, or three-digit number or a string of numbers (or alpha-numeric characters when programming names and messages). Successive entries are separated by a space or a comma (n n n or n,nn,nnn) while blocks of numbers are indicated by hyphen (n-nnn).
- Should programmers introduce a numbering conflict while renumbering a feature dialing code, the system will prompt them to remove the conflict. They may have to renumber several features to completely clear any conflicting numbers.

3 Understanding Keyboard And Terminal Definitions

3.1 Reviewing The Keyboard Definitions

The following list describes the functional keys on the keyboard.

- **Number keys**: Use keys 0–9 for selecting menu items, lines of data to edit, or for editing numeric prompts.
- **Alphabetic keys:** Use keys A–Z and a–z for entering string information such as names and messages. Always begin names of stations, lines, and so forth with a letter or a space.
- **ESCAPE key**: Either of these keys will return you to the previous command prompt and cancel whatever input was in progress. This action may or may not cause the previous screen to be redrawn depending on the current mode. When you enter a change at most of the programming menus, you must press the ESCAPE key and type a y followed by the ENTER key to save the change.
- **Punctuation and Symbol keys:** Except for comma (which is a field delimiter), use the punctuation and symbols on the keyboard just as you use the alphabetic keys.
- **RETURN or ENTER key**: Use this key to terminate the response to a command prompt or to end the editing of a data field. The system ignores a RETURN without any preceding input except when you are editing database information. During this operation, the RETURN key moves the cursor to the next vertical editing position.
- **SPACE BAR:** The space bar steps through the choices for program selections that provide multiple choices.
- **Tab Key**: Use this key during table editing to position the cursor to the next horizontal editing position.
- **Question mark (?)**: This key will display any help available concerning the currently displayed screen.

3.2 Reviewing The Control Key Definitions

The following list describes the control key functions. Unless otherwise noted, control keys are valid input at any time during programming.

- **Control C (C for Cancel)**: This key will cancel the current mode or function and return you to the last command prompt.
- **Control E (E for Edit or Erase)**: Use this key to edit a selected field or entry. On "smart" terminals, most fields will be automatically cleared when the first character is entered. Some fields allow the you to add to the current entry. On these types of fields, Control E will clear the entry and position the cursor at the beginning of the field. You can also use this key to erase a field that has blanks for valid input such as an autodial number.
- **Control I (I for Increment)**: Use this key during table editing to position the cursor to the next horizontal editing position.
- **Control N (N for Next)**: Use this key to switch to the next page of data for those database items that fill more that one screen. There will always be an on screen note when this key is valid.
- **Control P (P for Previous)**: This key is identical to the Control N key except that it displays the previous page of information.
- **Control R (R for Redraw):** When you press this key the system will redraw the current screen display. Usually, you use this key when the terminal display is configured in brief mode.
- **Control X (X for eXit)**: Either of these keys will return you to the previous command prompt and cancel whatever input was in progress. This action may or may not cause the previous screen to be redrawn depending on the current mode. When you enter a change at most of the programming menus, you must press the ESCAPE key and type a *y* followed by the ENTER key to save the change.
- **Control S (S for Stop)**: Use this key to stop printouts.
- **Control T (T for Top):** Use this key to cancel whatever input was in progress and return to the top level menu. The top level menu will always be redrawn.
- **Control V**: Use this key to turn the entry field prompting on or off.

3.3 Reviewing The Terminal Mode Definitions

- **Control A**: Use this key to cause the system to send and receive data to an ANSI style terminal.
- **Control D**: Use this key to cause the system to send and receive data to a "dumb" terminal.
- **Control W**: Use this key to cause the system to send and receive data to a Wyse 50 compatible terminal.

4 Reviewing The Command Prompts and Error Reporting

4.1 Reviewing The Command Prompts

There are four different types of command prompts.

- **Menu Selection Prompt**: Use this prompt to make a menu selection. The system requires a numeric input and displays the valid range of numbers in the prompt that corresponds to the number of menu items displayed.
- **Edit Line Prompt**: Use this prompt on database editing screens to get to the desired line number to be edited. The system requires a numeric input and displays the valid range of numbers in the prompt that corresponds to the number of menu items displayed. Entering a RETURN (ENTER) at this prompt will automatically select the first item.
- **Station, Line or Class Of Service Prompt**: Use this prompt to get to the particular item or items that are to be edited. This prompt is waiting for numbers, a range of numbers, or names. You may specify a single item or multiple items separated by commas. Select a range of items by entering two numbers separated by a dash. The prompt shows the valid range of numbers but the system will accept names. The system accepts an item as a name if the first character is not a number. The system displays the database information of each item one at a time for viewing or editing. When you use the ESCAPE key to exit the database information screen, the system displays the next item in the list. When you use CONTROL C to exit the screen, all list processing stops and the prompt display returns. When you use CONTROL T to exit the screen, the system stops all list processing and displays the top level menu.
- **Multiple Choice Question Prompt**: This type of prompt asks a specific question concerning the current screen or function and shows the valid responses. Enter these responses as a single character followed by a RETURN (ENTER).

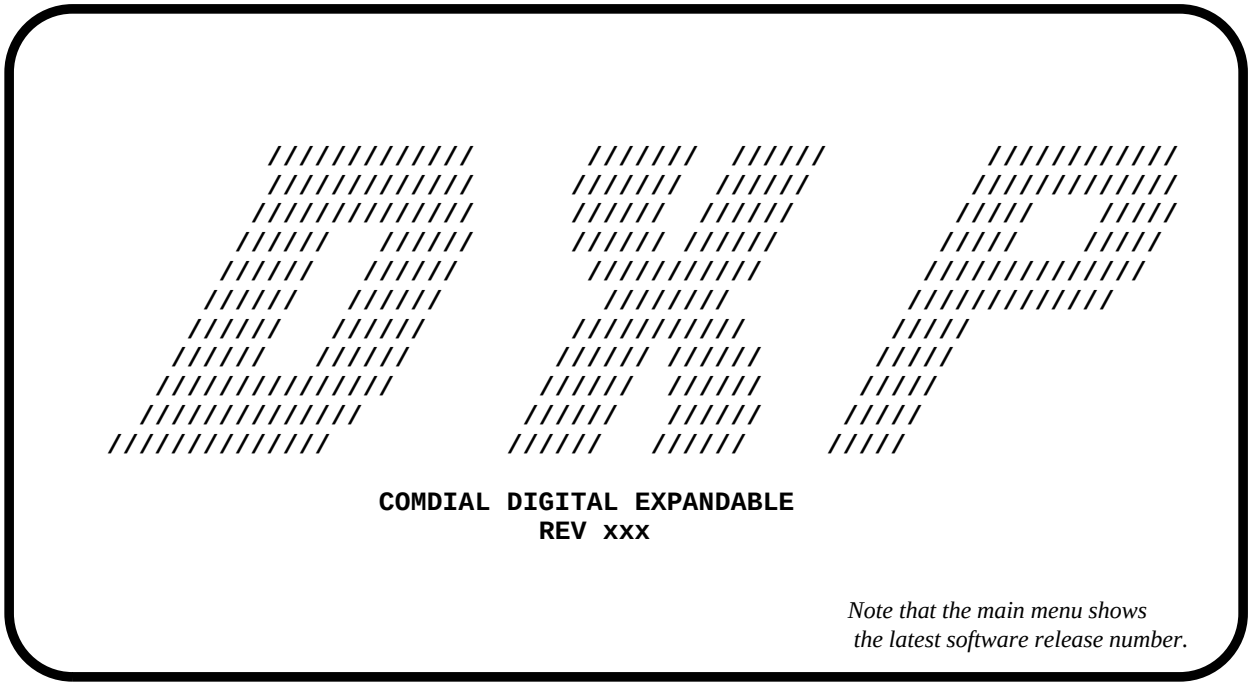
4.2 Reporting Errors

Pressing unexpected keys (such as letters when only numbers are allowed) or entering an out-of-range value at a prompt causes the keyboard alarm to sound. The system responds to other types of input errors by displaying an error message on the screen as soon as it detects the error. If the system detects a value-out-of-range error, and if the valid range is not currently shown in the display, the error message includes the valid range of values for reference.

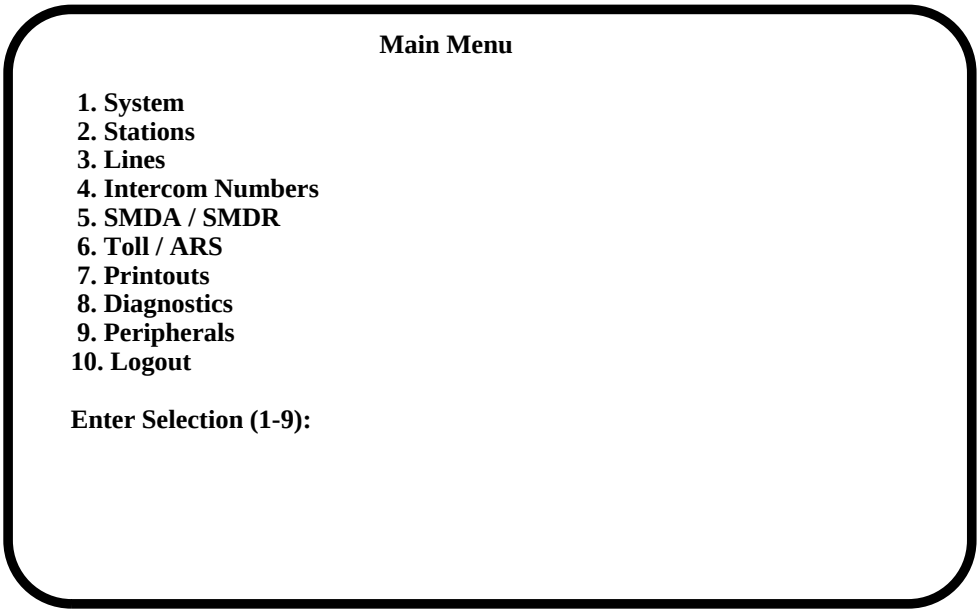
There is one circumstance for which the system does not report an entry error and this is when you are listing items at a station, line or COS prompt. In this case, the system processes valid items in the list up to the first invalid item that it encounters. It does not report the encountered invalid item as an error.

5 *Performing The VDT Programming*

Once successfully entered, the programming mode causes the VDT to display a welcoming menu. From the welcoming menu, type **I ✳ 7 4 6 ✳** (note that you must type a Capital **I**), and then press **ENTER** to display the main programming menu.

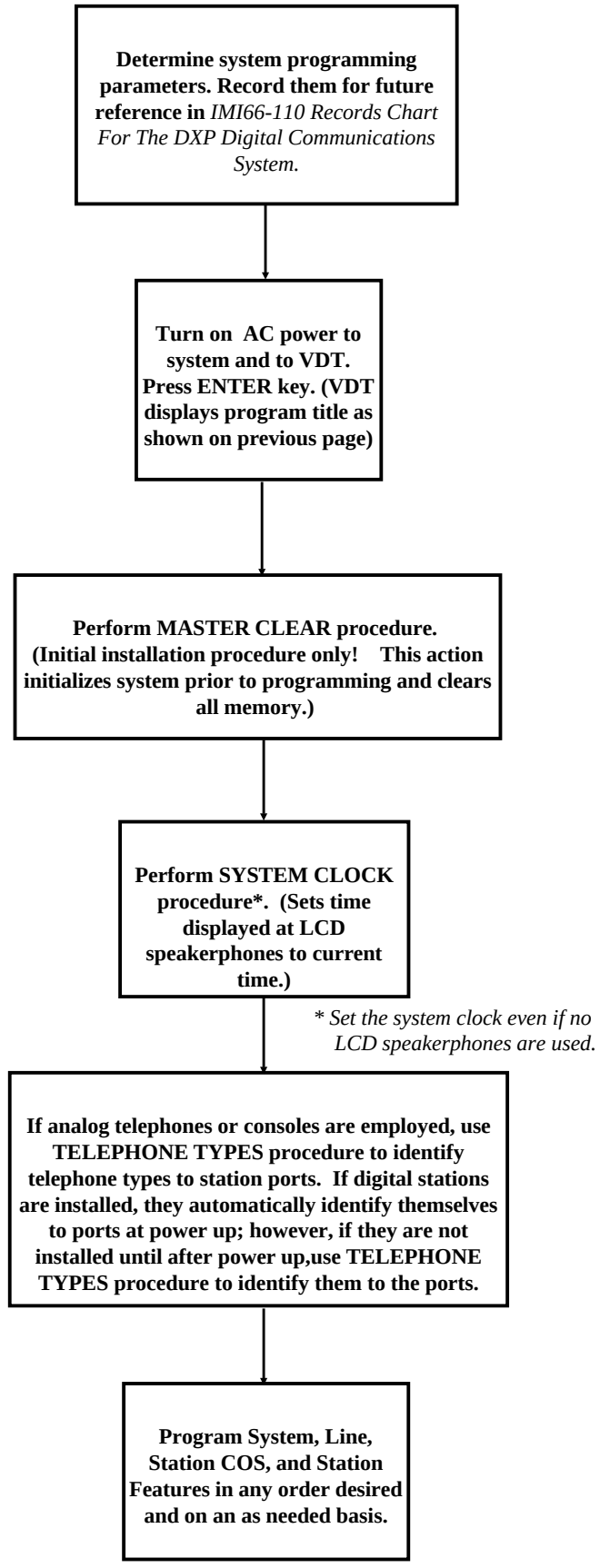


From the main programming menu, choose the type of programming that is required. Type the number of the choice and press **ENTER.**



5.1 Reviewing The Programming Progression

Program the system in the sequence shown in the following flow diagram.


Determine system programming parameters. Record them for future reference in IMI66-110 Records Chart For The DXP Digital Communications System.
Turn on AC power to system and to VDT. Press ENTER key. (VDT displays program title as shown on previous page)
Perform MASTER CLEAR procedure. (Initial installation procedure only! This action initializes system prior to programming and clears all memory.)
Perform SYSTEM CLOCK procedure*. (Sets time displayed at LCD speakerphones to current time.)
* Set the system clock even if no LCD speakerphones are used.
If analog telephones or consoles are employed, use TELEPHONE TYPES procedure to identify telephone types to station ports. If digital stations are installed, they automatically identify themselves to ports at power up; however, if they are not installed until after power up,use TELEPHONE TYPES procedure to identify them to the ports.
Program System, Line, Station COS, and Station Features in any order desired and on an as needed basis.

6 Programming System Features

- Default Functional Programming 6.1
- VDT Display Configurations (Terminal Setup) 6.2
- Messaging 6.3
- Database Storage 6.4
- Serial Port (Serial Data Port Parameters) 6.5
- Subdued Off-Hook Voice Announce (SOHVA) Programming 6.6
- Speed Dial Programming 6.7
- System Clock (Time and Date) 6.8
- System Timing 6.9
- System Parameters 6.10
- Paging Programming 6.11
- Password Programming (Change Password) 6.12
- Feature Renumbering 6.13

6.1 Default Functional Programming

6.1.1 Master Clear

Description: The master clear feature in an on-line procedure that returns the entire system to the default operating parameters, clears all stored speed dial numbers, and clears any other custom programming as well. Master clear is not part of the off-line PCMMI programming procedure. The system takes 15 to 20 seconds to exercise a master clear command depending upon the system size.

You can take one of three different master clear options.

With master clear mode 1 option, the system assumes a set of parameters that reflect a key system arrangement. This means that multiline telephones, except stations 101 and 102, receive direct line appearances in their button maps but have no group intercoms assigned to their hunt lists. Stations 101 and 102 have four group intercom numbers assigned to their hunt lists and are button mapped accordingly.

With master clear mode 2 option, the system assumes a set of parameters that reflect a hybrid, or PBX-like, system arrangement. This means that multiline telephones have no direct line appearances in their button maps; however, they do have two unique group intercoms assigned to their button maps and to their hunt lists.

With master clear mode 3 option, the system assumes a set of parameters, that does not map any station buttons, assigns no group intercom access or personal intercom numbers to the stations, and disables both zone and all-call paging features.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. Select master clear and press ENTER.
5. Type y or n (yes or no) to confirm master clear; press ENTER.
6. Select system default mode (1 = mode 1, 2 = mode 2, 3 = mode 3) and press ENTER.

CAUTION

You can only exercise the master clear when you enter the programming session with the installer password; however, in a defaulted system, the administrator password is the same as the installer password thus giving master clear privileges to the administrator as well. Refer to Section 6.12, Password Programming to customize the passwords.

Central Processor Unit Switched Master Clear

Description: When following the installation procedures for software replacement as described in publication IMI89–095, *Installation Instructions DXP Digital Communications System Expanded Memory Card and Software Upgrade Card*, you are told to save the data base, master clear the system, and replace the memory card. If you do not master clear the system, it is possible the DXP will not perform properly with the new memory card. The DXCPU-68K board provides a method for the master clear to occur automatically at the initial power up after you have changed or upgraded the software card. When you perform an upgrade, you must execute the following sequence of events exactly as they are stated here:

Programming:

1. Save the system data base. This step is critical. Refer to Section 6.4, Database Storage for programming details.
2. Turn off the AC power to the DXP and replace the memory card on the DXCPU-68K board. Refer to IMI89-095 for mechanical details.
3. Set DIP switch 8 to its ON position. This step enables the DXP to perform the master clear and is a required step; otherwise, the software upgrade will not occur.
4. Install the DXCPU-68K board and new software card in the DXP, and turn on the AC power. The DXP automatically executes a master clear operation.
5. After system powers up, set DIP switch 8 to its OFF position, and restore the data base using the Section 6.4 procedure.

NOTE: The system performs the automatic master clear once following the initial power up after you have up-graded the software. It will not perform an automatic master clear operation again after subsequent power ups.

6.1.2 System Default

Description: The system default sets the system configuration features to the default operating parameters. When the system default is performed, certain programmed data, such as custom LCD messages and system speed dial numbers, are lost.

Programming;
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select system and press ENTER.
5. Type y to confirm default or n to deny.

6.1.3 Class Of Service Default

Description: There are 32 station class of service (COS) feature sets or grouping of features. Each set can have differently configured features. This default programming returns one or all station COS sets to the default configured parameters.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select system and press ENTER.
3. From the system menu, select defaults and press ENTER.
4. From the defaults menu, select station COS and press ENTER.
5. Type 1-32 to enter class of service to be defaulted. Enter the numbers for the COS sets to be defaulted (n,n,nn) or enter a range of numbers (n–nn).

6.1.4 Station Default

Description: Each station can have individually configured operating features. The station default sets the configuration of these features to the default parameters. Personal speed dial numbers and autodial numbers are cleared with the station default action.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select stations and press ENTER.
5. Type intercom number or station name.

6.1.5 Button Map Default

Description: Every programmable button at each telephone connected to the system provides line selection, direct station selection, or other functions. Programming action for a particular station assigns a function to each button. Unique button function assignment, known as button mapping, at each station is possible. This default erases all unique button function assignments.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select button maps and press ENTER.
5. Type intercom number or station name.

6.1.6 Line Default

Description: Each line can have individually configured operating conditions. The line default sets these conditions to the default parameters.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select lines and press ENTER.
5. Type line port number (1-128) or name.
6. Enter the numbers for the lines to be defaulted (n,n,nn) or enter a range of numbers (n–nnn).

6.1.7 Tables Default

Description: Various system-wide operating features depend upon tables of information to control their parameters. These tables are programmable to let the features match a broad range of site requirements. This table default procedure resets the following programmable tables to the default conditions: SOHVA tables, toll restriction tables, ARS route tables, modify digits tables, and account code verify tables.

CAUTION

Remember, the system erases all programmed entries when you take this defaulting action.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select tables and press ENTER.
5. Type y to confirm default or n to deny.

6.1.8 DID Translation Table, Default

Description: If you have programmed translation tables for DID use (Section 8.4.4, *DID Translation Table Programming*), you can clear them with this procedure.

Programming;
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select DID translation table and press ENTER.
5. Type DID table number (1–4) and press ENTER.
6. Repeat step 5 until finished.
7. Press ESCAPE to end.

6.1.9 Clear System Status Log

Description: If you have enabled system status reporting (Section 6.10.6, *System Status Reporting*) at a station, you can turn off its status light by using this procedure. Use the Section 13 procedure to view the status report before turning off the light at the status reporting station.

Programming;
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select clear system status log and press ENTER.
5. Press ESCAPE to end.

6.1.10 Voice Prompts/Programming Default

Description: If your system includes a Digital Voice Announcer (DVA) you can use the following procedure to clear voice messages, the translation digits, and the voice analysis report of all existing information. Refer to Section 14.3.3, *Programming for DVA Operation*, for the programming discussion about these features.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select voice prompts/programming and press ENTER.
5. Type letter code for DVA feature to be defaulted.
6. Press ESCAPE to end.

6.2 Terminal Setup *(VDT Display Configurations)*

Description: You must match the system to the type of VDT that you use to program it.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select terminal setup and press ENTER.
4. From terminal setup menu, type selection (1–4) for terminal choice.
5. Press SPACE bar to change or ENTER to maintain.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.3 Messaging

6.3.1 LCD Messaging

Description: This procedure enables a class of service messaging feature. It allows station users to set a message at their stations that will be displayed on calling LCD speakerphones. You can use the second part of this procedure to program the actual LCD messages. Alternately, The attendant can program the LCD messages using procedures found in the attendant guide.
Also refer to Section 6.3.2, *Message Deposit*.

Programming: To enable feature for class of service,

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. From COS programming menu Type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

To program LCD Messages,

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, type item number for feature and press ENTER.
4. From LCD messages menu, type selection (1–10) and press ENTER.
5. Type message and press ENTER. Message can be 16 characters long.
6. Repeat steps 4 and 5 for all messages. Press CONTROL N for more LCD message lines.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Operation: Turn message on: press INTERCOM, dial S 02, then dial message code (01 through 30) #.
Turn Message off: press INTERCOM, dial # 02.

6.3.2 Message Deposit (Response Messaging)

Description: This procedure enables a class of service messaging feature that allows station users to call an LCD speakerphone and arrange for a message to be left on its display. The message is for the called party to read if she or he is unable to answer the caller. Refer to Section 6.3.1, *LCD Messaging*, for details about programming the LCD messages that can be deposited. Also, you can use the procedure detailed in Section 7.3, *Square/Nonsquare System–Button Mapping By Station*, to assign a Response Message button to the telephone; however, users can do this for themselves if they need the button.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

6.3.3 Message Waiting (Message Wait Originate)

Description: When you enable this feature, a station user can dial a feature code to control the message waiting light at another station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

Operation: Turn message waiting light on: press INTERCOM, dial ✶ 3.
Turn message waiting light off: press INTERCOM, dial # 3.

6.4 Database Storage

6.4.1 Save/Restore Database

Description: This feature will save a database externally from the DXP and restore it after you have turned the DXP off and upgraded the operating system software. Also, you can use this feature anytime to back up the stored programming as a security measure. Employ a personal computer with an XMODEM communications program to store the database on a magnetic diskette and reload it from the diskette after software upgrades. The saved and reloaded database includes the following data: system information, station parameters, line parameters, toll restriction and automatic route selection parameters, and system speed dial numbers but it does not include the SMDA/SMDR records. If you need these SMDA/SMDR records, you must make a printout of them before you perform the database storage. This is necessary because this save/restore feature does not record the stored records and they will be lost. Use the Section 13, *Selecting System Printouts*, procedure for this purpose. Also refer to Section 6.4.2, *Software Upgrade*, for software upgrade considerations.

NOTE: This programming procedure details steps that one follows when using the communications software program known as PROCOMM (produced by Datastorm Technologies). If you are using a different communications software, your steps may be different.

During programming, the system stores feature data at several places in its database. To ensure that a database save procedure includes all of a feature's stored data, the system saves the entire database whenever you perform the save/restore database programming procedure.

Programming: To save the database,

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select save/restore database menu and press ENTER.
4. Type item number for save database and press ENTER.
5. Press page-down button.
6. Type prompted number to choose XMODEM protocol.
7. Type name of file where database is to be stored, and press ENTER.
   Database save is automatic.
8. To quit, press ESCAPE.

To restore the database,

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select save/restore database menu and press ENTER.
4. Type item number for restore database and press ENTER,
5. Press page-up button.
6. Type prompted number to choose XMODEM protocol.
7. Type name of file where database is stored and press ENTER.
   Database restore is automatic.
8. To quit, press ESCAPE.

6.4.2 Software Upgrade

Description: This feature will save a database internally within the memory of the DXP and restore that database after you have turned the DXP off and upgraded the operating system software. Saving the database in this manner eliminates the need for a personal computer with an XMODEM communications program to translate the database between software upgrades. The saved and reloaded database includes all of the following data: system information, station parameters, line parameters, toll restriction and automatic route selection parameters, and system speed dial numbers but it does not include the SMDA/SMDR records. If you need these SMDA/SMDR records, you must make a printout of them before you can perform the database storage. This is necessary because this save/restore feature overwrites the current stored records and they will be lost. Use the Section 6.13, *Feature Renumbering*, procedure for this purpose.

CAUTION

For this procedure to work properly, the system must include the expanded memory card (DXRAM-EXP68K). If the system has the standard memory card (DXRAM-STD68K), you should use the procedures detailed in Sections 6.1.1,* Master Clear, *and 6.4.1,* Save/Restore Database*.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select default and press ENTER.
4. From default menu, select onboard software upgrade and press ENTER.
5. Type y for yes or n for no to respond to prompt concerning SMDA/SMDR records.
6. After the system saves the database, turn off the AC power to the system, upgrade the operating software, and turn the AC power back on. The system will automatically reload the saved database into the upgraded operating software and log out of the programming mode.

NOTE: The system will take an additional two to three minutes to power up after it receives AC power because of the time required for the database restore processing.

6.5 Serial Ports (Serial Data Port Parameters)

Description: The DXP provides two main serial data ports on the CPU board. In addition, it provides four auxiliary serial ports on each DXOPT-COM communications card that your installer adds to each DXAUX auxiliary circuit board. Since a DXAUX board accepts two DXOPT-COM cards and the system accepts two DXAUX boards, the DXP can provide a maximum of 16 auxiliary serial data ports. Coupled with the two main serial data ports, the system provides a total of 18 serial data ports. Every serial data port provides an RS-232 interface that you can use for such things as VDT and data printer connection. The system recognizes the serial data ports by unique number identifiers. The main serial data ports are 1 and 2, and the serial data ports on the first DXAUX board are 3–6 (upper slot) and 7–10 (lower slot). The serial data ports on the second DXAUX board are 11–14 (upper slot) and 15–18 (lower slot). The port numbering of the auxiliary serial data ports are fixed. This means that if the system provides only one DXOPT-COM located in the lower slot on the first DXAUX board, the auxiliary serial data ports are 7–10.

Use this procedure to set the data communications parameters of the serial data ports. The serial data parameters that you set using this procedure remain in effect until you reprogram them. The settings will not change even if you perform a master clear of the system unless you use the switched master clear method detailed in Section 6.1, *Central Processor Unit Switched Master Clear*. With that procedure, the system also defaults its serial data ports.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select serial ports and press ENTER.
4. From serial ports menu, type item number for main port or for auxiliary port and press ENTER.
5. From serial port type menu, select the serial port number and press ENTER.
6. Press SPACE bar for feature setting
7. Press TAB for next parameter.
8. Repeat steps 6 and 7 for all parameters.
9. Press ENTER to accept settings.
10. When finished, press ESCAPE twice.
11. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
12. Press ESCAPE to end.

6.6 Subdued Off-Hook Voice Announce (SOHVA) Programming

6.6.1 Busy On SOHVA

Description: At default, the system returns a ring back tone to users who make SOHVA calls to busy stations; however, this procedure allows you to arrange for telephone users to receive a busy signal instead of the ring back tone. This feature lets non-LCD telephone users know that a called station is busy.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

6.6.2 SOHVA Beeps (SOHVA Tone Bursts)

Description: You can choose the number of tone bursts that each telephone user hears preceding a SOHVA message to be from one to six.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name for station and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type choice (1–6) and press ENTER.
7. Press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–9 for each station or press ESCAPE to end.

6.6.3 SOHVA Groups

Description: SOHVA calling groups control the pattern in which station ports receive and/or originate SOHVA calls to one another. You must first form the SOHVA groups and then assign the groups to individual stations. Use the Section 7.2.18, *SOHVA Groups*, procedure to assign groups to individual stations.

Programming: Form the SOHVA groups with this procedure.

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select SOHVA table and press ENTER.
4. Type t, r, c to select transmit or receive group or to clear SOHVA table and press ENTER.
5. Type 1–16 ENTER to select SOHVA group for programming.
6. Type SOHVA groups (1–16) to receive from or transmit to selected SOHVA group. Enter the numbers for the groups to be assigned (n,n,nn) or enter a range of numbers (for example, n–nn) to set.
7. Press ENTER and repeat steps 5 and 6.
8. When finished, press ESCAPE.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

EXAMPLE: As illustrated in the following menu, programming action enables group 12 to transmit to groups 3, 5 and 7. System default enables each group to transmit and receive with itself and enables group 16 to transmit and receive with all groups.

```
                    S O H V A   R e c e i v e

      1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16
    1 *  .  .  .  .  .  .  .  .  .  .  .  .  .  .  *
S   2 .  *  .  .  .  .  .  .  .  .  .  .  .  .  .  *
O   3 .  .  *  .  .  .  .  .  .  .  .  .  .  .  .  *
H   4 .  .  .  *  .  .  .  .  .  .  .  .  .  .  .  *
V   5 .  .  .  .  *  .  .  .  .  .  .  .  .  .  .  *
A   6 .  .  .  .  .  *  .  .  .  .  .  .  .  .  .  *
    7 .  .  .  .  .  .  *  .  .  .  .  .  .  .  .  *
T   8 .  .  .  .  .  .  .  *  .  .  .  .  .  .  .  *
r   9 .  .  .  .  .  .  .  .  *  .  .  .  .  .  .  *
a  10 .  .  .  .  .  .  .  .  .  *  .  .  .  .  .  *
n  11 .  .  .  .  .  .  .  .  .  .  *  .  .  .  .  *
s  12 .  .  *  .  *  .  *  .  .  .  .  *  .  .  .  *
m  13 .  .  .  .  .  .  .  .  .  .  .  .  *  .  .  *
i  14 .  .  .  .  .  .  .  .  .  .  .  .  .  *  .  *
t  15 .  .  .  .  .  .  .  .  .  .  .  .  .  .  *  *
   16 *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
```

Use this procedure to assign stations to SOHVA groups.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. Select SOHVA groups and press ENTER.
6. Type group number 0–16 (n,n,nn or n-nn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

6.7 Speed Dial Programming

6.7.1 Pause Time

Description: During speed dialing, it is sometimes necessary to have the system delay the sending of digits to give host system switching equipment time to prepare to receive them. A pause, stored in the speed dial number, provides this delay. This programming procedure determines the duration of the pause. The person who stores the speed dial number must press the telephone's HOLD button at the point in the number digit sequence where he or she needs the pause (for example, 9—pause—18049782200).

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, type item number for feature and press ENTER
4. From system timing menu, type appropriate line number and press ENTER
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.7.2 Speed Dial Groups

Description: The system provides 500 system speed dial numbers. These numbers are divided into 50 groups with 10 numbers available in each group. Assign none, one, or a range of groups (n–nn) to each station class of service. Also refer to Section 6.7.4, *System Speed Dial*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Type desired value (0–50) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

6.7.3 Speed Dial Sets

Description: A speed dial set is a group of 10 speed dial locations. The system allocates three speed dial sets to each telephone as a default but you can allocate up to 10 sets to a telephone if you wish. When a DSS/BLF console is operated as a companion to a telephone, you can allocate speed dial sets at the companion telephone that the system will then share with the console. The system reserves one speed dial set for the telephone's dial pad buttons 0–9.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type desired value for feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

6.7.4 System Speed Dial

Description: Use this programming feature to provide a list of 500 speed dial numbers to all stations in the system. Choose the prime line/last line used or designate the line or line group that the system will automatically select for speed dialing. Store up to 32 digits including 1-9, S, #, Hookflash signalling, and pauses. Also refer to Sections 6.7.2, *Speed Dial Groups,* and 12.6, *Automatic Route Selection For Speed Dial Numbers.*

Beginning with software release 8.B, you can alternately choose the intercom to be automatically selected for speed dialing. This enhancement allows you to store intercom selection along with feature codes as speed dial numbers for true one-button access to features (for example; store INTERCOM ✻11 and INTERCOM #1 at two locations for system wide availability to music on and music off). This enhancement will not accept S#0S or S#746S as programming entries and it ignores any entered pauses or hookflashes.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select speed dials and press ENTER.
4. From speed dial menu, type item number to edit or press ENTER for line 1.

NOTE: Pressing ENTER causes the system to accept the entry and move the cursor vertically one location downward. Pressing TAB causes the system to accept the entry and move the cursor horizontally one location to the right. Pressing and holding CONTROL while typing an E erases a number.

5. Press TAB to set cursor to preset column.
6. Press SPACE bar to choose intercom, prime/last (line), line, line group, or ARS.
7. Enter 1–128 for line port, 1–16 for line group, or 1–128 for ARS line to store as prefix to speed dial number.
8. Press TAB for number entry column.
9. Type speed dial number (up to 32 digits of: 0–9, ✻, #, P = pause, F = hookflash) and press ENTER.
10. Repeat steps 4–9 for all speed dial numbers
11. When finished, press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Operation: While on hook, dial ✻ 100 through ✻ 599.

6.8 System Clock (Time and Date)

Description: The system clock provides time and date information for display on LCD speakerphones and for SMDR/SMDA timing and reporting. You must set the correct time and date to allow the system to operate properly.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, type item number for feature and press ENTER.
4. Type time in 24 hour format (hh:mm) using leading zeros for entries less than 10 and then press ENTER.
5. Type date (mm–dd–yy) using leading zeros for entries less than 10 and press ENTER.

6.9 System Timing

6.9.1 Call Park Recall

Description:

A call that is left in a park orbit longer than the length of time that you program with this feature will automatically return to a hold recall condition at the parking station. Also refer to Section 7.1.6, *Call Park*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.2 Page Recall

Description: This timing feature determines the amount of time that a Tracker page remains in a Tracker page orbit before recalling to the paging station. Refer to Section 14.2, *Tracker Paging System Programming* for complete Tracker programming information.

Programming:
1. Press CONTROL T for main menu.
2. Form main menu, select system and press ENTER.
3. From system menu, select system timing and press ENTER.
4. From the system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.3 Camp-On Tone

Description: Use this procedure to set the duration of the call waiting tone that the system sends to a busy station. Also refer to Section 7.1.8, *Call Waiting* .

Programming:
1. Press CONTROL T for main menu.
2. Form main menu, select system and press ENTER.
3. From system menu, select system timing and press ENTER.
4. From the system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.4 DTMF Extended Dialing *(Tone Length)*

Description: Use this programming feature to set the length of the DTMF tones. The system generates DTMF tones of extended length when users take their telephones off-hook and then wait until after the system sounds the *extended dialing tone burst* before they engage automatic dialing (for example, press speed dial buttons or saved number redial button) at their stations. Also, if analog telephone users take their telephones off-hook and then wait to begin manually dialing until after the system sounds the *extended dialing tone burst*, the system will extend the length of the manually dialed DTMF tones. After setting this extended DTMF tone length, you must enable the feature's use at each station where it is needed (Section 7.2.31, *Extended DTMF Dialing)*.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER.
4. From the system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.5 Timed Recall (Held And Transferred Calls)

Attendant Hold Recall

Description: After a call has been on hold at an attendant station for a programmed length of time it recalls to the attendant station. Use this procedure to set the length of the recall time for a held call at an attendant station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Hold Recall

Description: After a call has been on hold at a station for a programmed length of time it recalls to the station that placed it on hold. Use this procedure to set the length of the recall time for a held call.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Station Transfer Recall

Description: After a transferred call has been waiting at a station for a programmed length of time it recalls to the station that transferred it. Use this procedure to set the recall time for a transferred call.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.6 Paging Access

Description: If you have enabled paging transmit capability (see Section 6.11.3, *Paging Transmit*) at a station, it has access to external paging equipment. With this procedure, you can set the maximum length of time that the station can stay connected to the equipment.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.7 Pause Time

Description: During speed dialing, it is sometimes necessary to have the system delay the sending of digits to give host system switching equipment time to prepare to receive them. A pause, stored in the speed dial number, provides this delay. This programming procedure determines the duration of the pause. The person who stores the speed dial number must press the telephone's HOLD button at the point in the number digit sequence where he or she needs the pause (for example, 9—pause—18049782200). Also see Section 6.7, *Speed Dial Programming*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, type item number for feature and press ENTER
4. From system timing menu, type appropriate line number and press ENTER
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER..

6.9.8 Recall/Flash

Description: A station can generate either a line disconnect signal (recall) or a host system feature access signal (flash) when its user presses the telephone's TAP button. Use this procedure to arrange for either the recall or the flash signal.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.9 Periodic Tone Time

Description: After you enable the periodic warning tones that remind users to keep conversations short on certain outside lines (Section 7.1.31, *Periodic Line Tone*), use this procedure to set how often that you wish the periodic warning tones to occur

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.10 Maximum Call Duration (Time)

Description: After you enable the maximum call duration feature (Section 7.1.32, *Maximum Call Duration*), use this procedure to set the cut off time.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.11 Internal Interdigit Dialing

Description: A timer starts running with the dialing of each digit during intercom number dialing. It also starts running whenever the user accesses the intercom number path and does not dial any digits. When the timer times out, the system returns the station to an idle state. Use this procedure to set the intercom dialing time-out period for the entire system.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing.
8. Press ENTER to end.

6.9.12 Line-To-Line Connect Duration

Description: After you have given a station the ability to set up an unsupervised conference between two lines (Section 7.1.36, *Line-To-Line Transfer*), you should use this procedure to set the maximum amount of time that an unsupervised conference can continue between two lines. When the time out occurs, the system recalls the station from where the user enabled the unsupervised conference.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.13 Camp-On/Automatic Call Back Ring

Description: After you use Section 7.1.8, *Call Waiting Tone*, to enable a call waiting tone, use this procedure to set the duration of the camp-on/automatic ringback ring that the system sounds when it returns a camp-on call to the original station..

Programming:
1. Press CONTROL T for main menu.
2. Form main menu, select system and press ENTER.
3. From system menu, select system timing and press ENTER.
4. From the system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.14 Out Dial Delay Time

Description: The system will wait for a programmed length of time before sending automatically dialed numbers over an outside line. This delay gives the host system time to return dial tone before the system begins dialing the number. Different host systems require different periods of time between when a line is picked up and when dial tone is returned. Use this procedure to match this system to your host system.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.15 Authorization Code Time-out

Description: Use the Section 10.5, *Authorization Code*, procedure to enable authorization codes. Once a user uses an authorization code feature to access his or her telephone features, they remain in effect until any idle time at the telephone exceeds the authorization code time-out period that you program with the following programming steps.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.16 IST Ring Time-out

Description: Use this procedure to set the number of times that the system sends a ring signal to an industry-standard telephone on a system-wide basis. Although the ringing stops at the industry-standard telephone when the time-out occurs, the system continues to present the call at the telephone for answering until the caller abandons it. See Section 7.2.35, *Industry-Standard Telephone Support*, for other IST programming requirements.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.17 IST DTMF Receiver Time-out

Description: You can program the amount of time that the system waits to receive a DTMF tone from an industry-standard telephone, after the user has lifted the telephone's handset and before he or she has pressed a dial pad digit, on a system-wide basis. The system disconnects the telephone after this time-out occurs. If this happens, the user must hang up the handset and lift it again to re-establish the dial tone. See Section 7.2.35, *Industry-Standard Telephone Support*, for other IST programming requirements.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.18 IST Flash Time

Description: You can program the timed length of the signal that results when a user of an industry-standard telephone presses and releases the telephone hookswitch (or presses the TAP button if available on his or her telephone) on a system-wide basis. Often, a signal with a short time length (typically 500–750 ms) serves to alert the system to receive a feature code (flash) while a signal with a long time length (typically 1.5–2.0 sec) serves to disconnect the line and re-establish dial tone (recall). The value that you set with this procedure is the maximum value for recognizing a flash from an industry-standard telephone. Beginning with software release 6.A, you can also set the minimum value for recognizing a flash from an industry-standard telephone. See Section 7.2.35, *Industry-Standard Telephone Support*, for other IST programming requirements.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for minimum flash time and press ENTER.
5. Press SPACE bar for minimum time and press ENTER to accept setting.
6. Press ENTER to select maximum flash time line item.
7. Press SPACE bar for maximum time and press ENTER to accept setting.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.19 Voice Mail DTMF Tone

Description: The system provides a means by which you can set the length of the DTMF tones that it generates when a user dials a number from his or her telephone. Since the voice mail system may require a different DTMF tone length than that which you have provided for the telephones, the system provides a means for you to set a separate DTMF tone length for voice mail station ports. It defaults the length to 80 msec, but you can program other lengths as needed. Refer to Section 15, *Voice Mail Programming*, for other voice mail programming requirements.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.20 Pulse Dial Interdigit Time

Description: You can set the interdigit time between dial pulses when the system pulse-dials a number over a line. The DXP defaults this time to 200 msec. and provides a range of timing values between 100 msec. and one sec. that you can set in 100 msec. increments. Refer to Section 8.1.8, *Dialing Mode*, to enable pulse dialing.

Programming:
1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER,
4. From timing menu type item number for feature and press ENTER,
5. Press SPACE bar to select desired time and press ENTER to select setting.
6. Press ESCAPE twice,
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.21 Pulse Dial Make/Pulse Dial Break *(Pulse Dial Ratio)*

Description: Use this procedure to set the make/break ratio for rotary dial signalling to match rotary dial line requirements. You can set the line make/break ratio for rotary dial (pulse dial) signalling in a more flexible manner to match many different rotary dial line requirements. You can set the make time and the break time independently in one msec. increments to any time from one to 99 msec. Refer to Section 8.1.8, *Dialing Mode*, to enable pulse dialing.

Programming:
1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER,
4. From timing menu, type item number for line pulse make and press ENTER.
5. Type desired time (1–99) and press ENTER,
6. From timing menu, type item number for line pulse break and press ENTER,
7. Type desired time (1–99) and press ENTER,
8. Press ESCAPE twice,
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER,

6.9.22 Dialing Complete

Description: With systems operating with the E–1 Digital Carrier Line Board feature, you must use this timing feature to set the maximum amount of time that a user can wait between digits when he or she is dialing a number. In the E–1 operating environment, the central office system will not wait indefinitely for the caller to completely dial a number. Refer to the central office specifications for timing requirements.

Programming:
1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER,
4. From system timing menu type item number for feature and press ENTER,
5. Press SPACE bar to select desired time and press ENTER to select setting.
6. Press ESCAPE twice,
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.23 Periodic Conference Tone

Description: The conference advisory tone feature allows you to configure the system to provide an audible tone whenever more than two parties are connected in a conference call. You can enable this feature with a station class of service programming action (Section 7.1.47, *Conference Advisory Tone*) as either a one time tone or as a periodic reoccurring tone. If you choose a reoccurring tone, you must use the procedure herein to select the time interval between the reoccurring tones. Also refer to Section 6.10.19, *Location Code*.

Programming:
1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER,
4. From timing menu type item number for periodic conference tone and press ENTER,
5. Press SPACE bar to select desired time and press ENTER to select setting.
6. Press ESCAPE twice,
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.9.24 Periodic Executive Override Tone

Description: The executive advisory tone allows you to configure the system to provide an audible tone whenever a system user activates the executive override feature. You can enable this feature with a station class of service programming action (Section 7.1.48, *Executive Override Advisory Tone*) as either a one time tone or as a periodic reoccurring tone. If you choose a reoccurring tone, you must use the procedure herein to select the time interval between the reoccurring tones. Also refer to Section 6.10.19, *Location Code*, and Section 7.1.14, *Executive Override Programming*.

Programming:
1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER,
4. From timing menu type item number for periodic conference tone and press ENTER,
5. Press SPACE bar to select desired time and press ENTER to select setting.
6. Press ESCAPE twice,
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.10 System Parameters

6.10.1 Synchronized Ringing

Description: The system can provide an audible distinction between internal and external call ringing when needed. Enable or disable that feature with this programming procedure. This feature does not apply to direct inward dial lines (Section 8.4, *Direct Inward Dialing Support*) and E&M lines (Section 8.7, *Tie Line Support*).

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, select synchronized ringing.
5. Press SPACE bar for feature setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Press ESCAPE to end.

6.10.2 Automatic Attendant Immediate Transfer

Description: You should choose this automatic attendant immediate transfer mode for voice mail transfers. It allows the system to transfer a call as soon as it answers. However, if you turn on the voice mail screen and confirm options (see the voice mail programming manual for details), do not turn on this immediate transfer mode. Immediate transfer is a system-wide parameter and affects all telephones in the system.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.10.3 Automatic Route Selection (ARS Enable)

Description: You can enable or disable automatic route selection on a system-wide basis. A defaulted system has ARS disabled. Refer to Section 12, *Enabling Automatic Route Selection*, for other ARS programming details.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select system parameters and press ENTER.
4. From the system parameters menu, select ARS feature and press ENTER.
5. Press SPACE BAR to toggle between enable and disable.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

6.10.4 ARS (Automatic Route Selection) Dial Tone

Description: You can select one of three ARS dial tones that you hear whenever you enter the ARS access code.

- Dial Tone 1—steady intercom dial tone (dual tones of 480 Hz + 620 Hz),
- Dial Tone 2—same as dial tone 1 only preceded by three short tones (200 ms on, 200 ms off)
- Dial Tone 3—steady simulated central office ring back tone (dual tones of 440 Hz + 480 Hz).

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. Select ARS dial tone from the system parameters and press ENTER.
5. Press SPACE bar to toggle between dial tone 1, dial tone 2, and dial tone 3.
6. When finished, press ENTER.
7. Press ESCAPE twice to end.

6.10.5 Toll / ARS Dialing Pause

Description: To create toll restriction parameters for the system, program restricted numbers as entries in the toll restriction table using programming details provided in Section 11.6, *Restricted Number Programming.* From that discussion, learn about entering a pause as part of the restricted number's digit string. Use the following programming procedure to enable the system to accept that pause entry at the end of a restricted number's digit string.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, select toll/ARS dialing pause and press ENTER.
5. Press SPACE bar for feature setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.10.6 System Status Reporting

Description: Use this procedure to enable system status reporting. If you enable status reporting, the system will notify certain designated stations when system status conditions occur, and turn on an status light at those stations. Refer to the Section 7.3, *Square/Nonsquare System—Button Mapping By Station*, procedure to map a status light at a telephone.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, select system status reporting and press ENTER.
5. Press SPACE bar for feature setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Operation: When the status light turns on, use the Section 13, *Selecting System Printouts*, procedure to view status conditions, and then use the Section 6.1.9, *Clear System Status Log*, procedure to turn off the status light at the status reporting station.

6.10.7 T1 Status Reporting

Description: Use the following instructions to enable the T1 status reporting feature. Use the Section 6.14, *T1 Status Log Parameters*, procedure to program the status reporting and alarm alerting parameters. Refer to Section 8.9, *Programming The T1 Parameters*, for complete T1 programming details.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, select T1 status reporting and press ENTER.
5. Press SPACE bar for feature setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER

6.10.8 Major Alarm Alerting *(T1 Alarm Alerting)*

Description: Use the following instructions to enable the T1 alarm alerting feature. Use the Section 6.15, *Major Alarm Alerting*, procedure to program the status reporting and alarm alerting parameters. Refer to Section 8.9, *Programming The T1 Parameters*, for complete T1 programming details.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, select major alarm reporting and press ENTER.
5. Press SPACE bar for feature setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER

6.10.9 Central Message Desk

Description: Use this procedure to designate one station as the central message desk to take messages for other system stations, control the message waiting light at those stations, and deliver messages to their users upon request.

NOTE: Do not assign this feature to voice mail station ports since it activates only one port and inhibits all other station ports from having message wait originate capability.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, select central message desk and press ENTER.
5. Type personal intercom number or previously assigned name for desired station.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Press ESCAPE to end.

6.10.10 IST Ringing Per Phase

Description: While the installer typically connects one industry-standard telephone per IST station port, he or she can connect two industry-standard telephones per IST station port; however, they will share the same assigned intercom number. When he or she installs one telephone per port, you must set the IST ringing per phase feature to 16. When the installer places two telephones at any IST station port, you must change the IST ringing per phase feature to 8. A setting of 16 allows up to 48 industry-standard telephones per cabinet (main cabinet and expansion cabinet) to ring simultaneously. A setting of 8 reduces this simultaneous ringing total to 24 telephones per cabinet. This programming selection is on a system-wide basis. See Section 7.2.35, *Industry-Standard Telephone Support*, for other industry-standard telephone programming features.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters menu, and press ENTER.
4. From the system parameters menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ESCAPE once.
6. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.10.11 IST Ringing Patterns *(Ring Mode)*

Description: You can program the ringing pattern for either IST ring mode one or IST ring mode two. Mode one causes a two-second ring phase while mode two causes a shorter one second ring phase. For this feature to function properly, insure that the DXIST (industry-standard telephone interface board) contains firmware revision 2C or higher

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. Select IST ring mode from the system parameters and press ENTER.
5. Press SPACE bar to toggle between mode 1 (default) and mode 2.
6. When finished, press ENTER.
7. Press ESCAPE twice to end.

6.10.12 IST Ring Frequency

Description: The system will allow you to set a ring frequency of 25 Hz for international applications or set a ring frequency of 21 Hz for domestic applications. Choose a setting that matches the ring frequency of the installed ring generator.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. Select IST ring frequency from the system parameters and press ENTER.
5. Press SPACE bar to toggle between choices of 21 Hz and 25 Hz.
6. When finished, press ENTER.
7. Press ESCAPE twice to end.

6.10.13 Operator Station

Description: You can designate the station that you want to ring when system users dial the operator. Usually this station is an attendant position station; however, the operator station can be any station in the system. In other words, the operator station does not have to be an attendant position station (see Section 7.2.30, *Attendant Position*) if you do not want it to be one.
For more versatility, you can change the code that users dial to call the operator station from a default of 0 to the dialing code of your choice.

Programming: To designate the operator station, use the following procedure:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select system parameters and press ENTER.
4. From the system parameters menu, select feature and press ENTER.
5. Type personal intercom number for station and press ENTER.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

To change the operator dialing code, use the following procedure:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select feature renumbering and press ENTER.
4. From feature renumbering menu, select user feature menu and press ENTER
5. From user feature menu, type item number for operator access and press ENTER.
6. Press SPACE BAR to clear current code and type new code (type up to four digits—nnnn) and press ENTER.

NOTE: The number block 5024–5999 is unassigned at default. You can use a number from this block for code renumbering without causing a numbering conflict in the system..

CAUTION

If a number conflict exists between the new code that you need to assign and one that is currently in use, the system will prompt you to remove the conflict. Before responding to this prompt with a y (yes), be sure that doing so will not disturb other programmed features. It is possible to enter a situation where you must make several renumbering changes to completely resolve a number conflict.

7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

6.10.14 Line Disconnect Automatic Camp-On

Description: If a user at a current station selects a line that a previous station has released from busy but the system has not yet returned to idle, the system arranges for the current station to camp-on to the line before the system makes the line idle. After the system makes the line idle, it immediately connects the camped-on station to the line. With this feature disabled, a station can not select a line until after the system has returned the line to idle. Refer to Section 8.1.10, *Positive Disconnect Time*, to set the time that the system waits before it makes a line idle after a station releases it from busy.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.10.15 Automatic Station Relocation

Description: The system will automatically recognize a particular station should someone relocate it to a different station port. After being installed at a new port location, a relocated station will provide the same class of service parameters and station features that it provided at its original port location. Also, the relocated station will respond to the same personal intercom number that it responded to at its original port location. A relocated station prompts the user to take action to either accept its original programming or accept the programming at the new port. If the user takes no action, the station assumes the parameters and personal intercom number that is determined by the Section 6.10.16, *Default Relocation Response*, programming procedure.

Consider these following points when you enable station relocation:

- If someone does a station relocation, you must save the database programming to make the relocation permanent (Section 6.4, *Database Storage*).
- This relocation feature only applies to digital telephones.
- Users must ensure that the vacated port remains unused until they complete a relocation. If someone connects a telephone to the vacated port before users complete a relocation, the relocated telephone will not retain its original programming.
- When the user accept the original programming for the new port, the vacated port assumes the programming currently assigned to the new port (that is, a parameter exchange takes place between the vacated port and the new port).
- If a DSS/BLF console was assigned to the telephone at its original location, the console assignment follows the telephone to the new location even though the console is no longer located physically near the telephone. If you relocate the console, you must connect it to the desired station port and use the Section 7.4, *Telephone Types,* and Section 7.2.26, *DSS/BLF Console Installed*, procedures to program it for use at the new port.
- The relocation feature also applies to relocated digital telephone boards, however, the installer must ensure that the vacated port remains unused until the relocation is complete. All stations connected to the relocated circuit board show the relocation prompt.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Operation: For LCD speakerphone with interactive buttons,
- relocate telephone and note Keep Yes /No display,
- press YES to keep original programming or press NO to default the station parameters.

For LCD speakerphone without interactive buttons,
- relocate telephone and note Keep display and flashing HOLD light,
- press HOLD to keep original programming or press # to default station parameters.

For Non-LCD telephones,
- relocate telephone and note flashing HOLD light,
- press HOLD to keep original programming or press # to default station parameters.

For all telephone types,
- relocate telephone and take no action for 10 seconds,
- relocated telephone assumes parameters determined by Section 6.10.9, *Central Message Desk*, programming.

Remember, station relocation only works with digital telephones.!

6.10.16 Default Relocation Response

Description: When someone relocates a digital telephone from one station port to another port, the relocated telephone prompts the user to take action to determine the station parameters. The user can either accept the parameters from the station's original port or accept those from the new port. He or she has 10 seconds to make the choice. If the user takes no action, the station assumes the parameters determined by this *Default Relocation Response* programming procedure. If you set the programming choice to YES, the relocated station assumes the parameters from the original station port. If you set the programming choice to NO, the relocated station assumes the parameters from the new port. Also refer to Section 6.10.15, *Automatic Station Relocation*, for additional station relocation programming details.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.10.17 Ring Back Tone

Description: By default, when callers call an intercom party, they receive an intercom ring back tone to tell them that the called intercom station is ringing. Also, when callers call over the CO line, they receive a CO-style ring back tone to tell them that the distant CO telephone is ringing. Some system users find intercom ring back tone confusing. If you encounter this situation with your users, you can take this programming action to assign CO-style ring back tone to intercom calls.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, type item number for ring back tone and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
   Tone 1 = intercom ring back tone
   Tone 2 = CO-style ring back tone
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.10.18 Day 1, Day 2, and Night Ringing Begin and End Times

Description: With this programming procedure, set the begin and end times of the day 1, day 2, and night ringing time periods. Also refer to Section 7.2.13, *Flexible Ringing Assignment* for related flexible ringing assignment programming.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From the system parameters menu, select day 1, day 2 or night ringing begin times and press ENTER.
5. Type times in 24–hour format (hh:mm) and press ENTER.
6. Press ENTER (repeatedly if needed) to place cursor at next time desired setting.
7. Repeat step 5 and press ENTER.
8. Repeat steps 6 and 7 until all times are set and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.10.19 Location Code

Description: The location code feature enhances system installation in the international community. When you set this code for a particular nation where you have installed the DXP, the DXP system automatically defaults certain system parameters to a setting that meets specifications set forth by that nation's technical standards. See also Section 6.9.23**,** *Periodic Conference Tone*, Section 6.9.24, *Periodic Executive Override Tone*, Section 7.1.47, *Conference Advisory Tone*, Section 7.1.48, *Executive Override Advisory Tone*, and Section 7.2.37, *Line Out Softkey Options*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, type item number for location code and press ENTER.
5. Press SPACE bar for feature setting (1–4) and press ENTER to accept setting.
   1 = U.S.A.—Standard system default codes for all system features.
   2 = South Africa —Standard system default codes for all system features except:
   — transmission and receive levels set to meet local standards,
   —frequency and cadence of call progress tones set to local standards.
   3 = Brazil—Standard system default codes for all system features except:
   — transmission and receive levels set to meet locate standards,
   —frequency and cadence of call progress tones set to local standards,
   —conference advisory tone turned on and set to provide periodic reoccurring tone,
   —executive advisory tone turned on and set to provide periodic reoccurring tone,
   —Selectable interactive button menu for LCD speakerphone displays set to substitute a release (RLSE) button for the automatic redial (ARDL) button.

   NOTE: Be sure to notify users of this button change as it is different from information provided in the user's guides.

   4 = Argentina and Chile —Standard system default codes for all system features except:
   — transmission and receive levels set to meet locate standards,
   —frequency and cadence of call progress tones set to local standards.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.11 Paging Zones (Paging Programming)

6.11.1 Zone Programming (Zone Names, Transmit Stations, Receive Stations)

Description: Use this programming procedure to arrange stations to transmit and receive voice announcements, to and from a particular group of stations or to all stations in the system. Also use this procedure to assign names to paging zones when a site requires named zones.

Programming: To place stations in paging zones and name the zones, use the following procedure.

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From systems menu, select paging zones and press ENTER.
4. From paging zones menu, select zone paging and press ENTER.
5. Enter zone number (1–8) and press ENTER.
6. From zone paging menu, type item number for zone name and press ENTER.
7. Type name (up to 16 character) and press ENTER.
8. From zone paging menu, type item number for transmit stations and press ENTER.
9. Press CONTROL E to edit station list, type a to add or r to remove and press ENTER.
10. Type station extensions (101–292) to add or remove them and press ENTER.
11. When finished, press ESCAPE.
12. Repeat steps 8–11 for receive stations and press ENTER.
13. When finished, press ESCAPE twice.
14. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
15. Repeat steps 4–15 for each zone or press ESCAPE to end.

Operation: Press INTERCOM and dial 70 for zones 1–8 (all call) or dial 71–77 for zones 2–8.

6.11.2 Paging Access

Description: If you have enabled paging transmit capability (Section 6.11.3, *Paging Transmit)* at a station, it has access to external paging equipment. With the following procedure, you can set the maximum length of time that the station can stay connected to that external equipment.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.11.3 Paging Transmit

Description: Use this procedure to give a class of service of stations the ability to transmit voice announcements to one or all other station monitor speakers. Also refer to Section 6.11.2, *Paging Access*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. From the COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

6.11.4 Paging Receive

Description: Use this procedure to give a class of service of stations the ability to receive voice announcements with the station monitor speaker.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

6.11.5 Meet Me Answer Page

Description: When you enable this feature at a station, its user can dial a code in response to an all-call or zone page and meet the pager in a private conversation.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

Operation: Hear a page, press INTERCOM and dial 78.

6.11.6 Relays (External Paging Equipment Control)

Description: If your installer connects customer-supplied external paging equipment to the system's external paging port and that equipment requires external control, use this programming procedure to assign a relay to control the paging equipment. Also refer to Section 6.11.9, *External Paging Port*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From systems menu, select paging zones and press ENTER.
4. From paging zones menu, select zone programming and press ENTER.
5. Enter zone number (1–8) and press ENTER.
6. From zone programming menu, type item number for relays and press ENTER.
7. Type relay number (1–4, 0 = none) and press ENTER.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 4–9 for each zone or press ESCAPE to end.

6.11.7 Relays (Line Answer From Any Station)

Description: Assign one or more of the four relays located on the central processor board to track the ring signal of any or all line ports. You can arrange for a relay to track the ringing of the direct, delayed, day 1, day 2, or night ringing modes. **Typically, installers wire these relays to control loud bells or other external ringers.** Users, upon hearing the external ringers, can dial feature codes to answer the call that is ringing on the associated lines.

Programming:
1. Press CONTROL T to return to main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select paging zones and press ENTER.
4. From the paging zones menu, select relays and press ENTER.
5. From the relays menu, select relay 1–4 and press ENTER.
6. From the relay n menu, type item number for ring type and press ENTER.
7. Press CONTROL E for edit menu.
8. From edit menu, type a to add or r to remove and press ENTER.
9. Type line port numbers 1-128 (type as n,nn,nnn or n–nnn to add or remove and press ENTER.
10. Press ESCAPE and repeat steps 6–9 for other ring types.
11. When finished press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
13. Repeat steps 5–12 for other relays.
14. Press ESCAPE to end.

Operation: dial 65 = relay 1, dial 66 = relay 2, dial 67 = relay 3, dial 68 = relay 4, dial 69 = relays 1 through 4 (when all are programmed with ringing)

6.11.8 Common Audible Ringer *(Common Audible Ringer Interface)*

Description: If your installer connects customer-supplied external paging equipment to the system's external paging port, use this programming procedure to arrange for that equipment to sound the ring signal of any or all lines. You can arrange for it to track the ringing of the direct, delayed, day 1, day 2, or night ringing modes. Upon hearing the ringing over the external paging equipment, the user can dial feature codes to answer the call that is ringing on the associated lines. Refer to Section 7.2.13, *Flexible Ringing Assignments*, to assign lines to the ringing modes.

NOTE: You can assign the same ringing pattern to an unused and unconnected relay (Section 6.11.2, Relays–Line Answer From Any Station*) that you assign to the external paging equipment with the following procedure. If you do this, station users can dial the call pick up codes associated with the assigned relays to answer the calls that sound over the external paging equipment.*

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select paging zones and press ENTER.
4. From paging zones menu, select common audible ringer and press ENTER.
5. From common audible ringer menu, select ringing type and press ENTER.
6. Press CONTROL E.
7. Type a for add, r for remove and press ENTER.
8. Type line port number 1–128 (n-nnn or n, nn, nnn) and press ENTER.
9. Press ESCAPE once and repeat steps 5–7 for next ring type or press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Operation: Directed call pickup = press INTERCOM ✻ 4 then dial extension of ringing telephone
Group call pickup = INTERCOM # 4
Line pick up with relay assigned, press INTERCOM and dial relay code 66–68 or 69.

6.11.9 External Paging Port *(External Paging Interface)*

Description: If your installer connects customer-supplied external paging equipment to the system's external paging port, use this programming procedure to assign the external paging port to a paging zone. When users want to page through the external paging equipment they must dial the code for the paging zone that you assign to the external paging port with this procedure. Also refer to Section 6.11.6, *Relays–External Paging Equipment Control*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From systems menu, select paging zones and press ENTER.
4. From paging zones menu, select zone programming and press ENTER.
5. Enter zone number (1–8) and press ENTER.
6. From zone programming menu, type item number for external paging port and press ENTER.
7. Type 1 for yes or 0 for no and press ENTER.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 4–9 for each zone or press ESCAPE to end.

6.12 Password Programming (Change Password)

You can use this programming procedure to change the VDT program entry password for both the installer and the administrator and change the main programming station entry code for the system manager and the attendant.

The default sequence for both the installer and the administrator VDT password entries is: I ✻746 ✻.
You can change part or all of either or both of these passwords to a customized sequence of up to 15 digits and/or letters. You can enter both upper and lower case letters if you desire but do keep in mind that the programmer must enter the password later just as you program it here with the letters properly placed in either upper or lower case. Thus, a new VDT entry password could be as follows: nnnnnnnnnnnnnn, or nnn, or just n (n = any number digit or any letter - for example 12345678, or Jane, or 1A, or any other combination that you pick.)

The default system manager station entry code is as follows: INTERCOM button, ✻ # 746 ✻.
You can change the default password portion of this station entry code (the 6 portion) to a custom value of up to 15 digits. Thus, a new station entry could be as follows: INTERCOM button, ✻ #74 nnnnnnnnnnnnnn ✻.
You can also change the feature code portion of the system manager station entry (the ✻#74 sequence). You can change the feature code from ✻#74 to a custom code of up to four digits (no letters allowed).
Thus, a new system manager entry could be as follows: INTERCOM button, nnnn 6 ✻.
Further, if you couple the allowed password change with the allowed feature code change, a system manager station programming entry code could be as follows: INTERCOM button, nnnnnnnnnnnnnnnnnn ✻.

The default attendant station entry code is as follows: INTERCOM button, ✻ #0 ✻.
The feature code part of this entry is the ✻#0 sequence. You can change the feature code from the ✻#0 code to a custom code of up to four digits (no letters allowed).
Thus, a new attendant entry could be as follows: INTERCOM button, nnnn ✻.

6.12.1 Changing The Password

Description: To change the password, follow this procedure.

Programming 1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select change password and press ENTER.
4. Type a for administrator, i for installer, or s for station and press ENTER.
5. Type the current password and press ENTER.
6. Type the new password and press ENTER.
7. Retype the new password and press ENTER.
8. Repeat steps 3–7 to create other new passwords.

6.12.2 Changing The Feature Code (System Manager And Attendant Station Entry Code)

Description: To change the feature code follow this procedure.

Programming: 1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select feature renumbering and press ENTER.
4. From the feature renumbering menu, select station programming and press ENTER.
5. From station programming menu, select row number for system manager or attendant and press ENTER.
6. Type new feature code (up to four digits - can include # and ✳) and press ENTER.

NOTE: The new feature code must not conflict with existing dialing codes. Either choose a different feature code or use the Section 6.13, Feature Renumbering*, programming procedure to renumber any dialing codes that conflict.*

7. Repeat steps 5 and 6 to set the other entry code if needed.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

6.13 Feature Renumbering

Description: Dialing codes for user features are flexible so that you can renumber them. This may be necessary if site requirements dictate that personal or group intercom numbers fall within a certain block or sequence. Since new number assignments can not conflict with existing number, the system provides a block of unassigned numbers that you can use for renumber assignment. At default, the system assigns blocks of numbers in the following ranges:
101–292 = personal intercom,
3101–3292, 4101–4292, 5000–5023 = group intercom,
5024–5999 = unassigned,
600—899, ✻, # = feature codes
9 = line group 1

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select feature renumbering and press ENTER.
4. From feature renumbering menu, select feature category and press ENTER.
5. From feature category menu, type item number for feature and press ENTER.
6. Type new code and press ENTER.

NOTE: The number block of 5024–5999 is unassigned at default. Use it for code renumbering.

7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

CAUTION

If a number conflict exists, the system will prompt you to remove the conflict. Before responding to this prompt with a y (yes), be sure that doing so will not disturb other programmed features that depend upon the removed extension number. It is possible to create a situation where you must make several renumbering changes to completely resolve a number conflict.

6.14 T1 Status Log Parameters

Description: After you use Section 6.10.7, *T1 Status Reporting*, to enable reporting, use the procedure below to program the T1 status log parameters. Also refer to Section 8.9, *Programming The T1 Parameters*, for complete T1 programming details.

Programming:

1. Press CONTROL T to return to main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select T1 status log parameters and press ENTER.
4. From the T1 status log parameters menu, select the row number for the error type you want to program. The cursor will move to the threshold entry field for that error type. Select any of the following threshold values:
   0 = never log the alarm
   1 = always log the alarm
   (2 to 999) = check this number of alarm occurrences during the selected time period and decide whether or not to log the alarm. (The maximum threshold for the bipolar and CRC alarm trigger is 255.)
5. After making your entry for the alarm threshold, press ENTER to advance to the next line in the threshold entry field, or press TAB to advance to the time period entry field.
6. With the cursor in the time period entry field, toggle through the choices using the space bar. When the system displays the time period you want to use, press ENTER to go to the next line in the time period entry field, or press TAB to advance to the next line in the threshold entry field.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

6.15 Major Alarm Alerting *(T1 Parameters)*

Description: After you use Section 6.10.8, *Major Alarm Alerting*, to enable alarm alerting, use the procedure below to program the audible alarms for the various T1 system errors. Also refer to Section 8.9, *Programming The T1 Parameters*, for complete T1 programming details.

Programming:

1. Press CONTROL T to return to main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select major alarm alerting and press ENTER.
4. Select the error type you want to program. The cursor will move to the threshold entry field for that error type. From the threshold entry field, select any of the following threshold values:
   0 = never go to alert status
   1 = go to alert status if the alarm is ever logged
   2 to 999 = check this number of occurrences during the selected time period to decide whether or not to elevate the alarm to alert status.
5. After making the alarm threshold entry, press ENTER to advance to the next line in the threshold entry field, or press TAB to place the cursor in the time period entry field.
6. With the cursor in the time-period entry field, toggle through the choices using the space bar. When the system displays the time period you want to use, press ENTER to go to the next line in the time period entry field, or press TAB to advance to the next line in the threshold entry field.
7. Press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

7 Programming Station Features

- Programming Class Of Service Features 7.1
- Programming Station Features 7.2
- Square/Non-Square System (Button Mapping by Station) . . . 7.3
- Telephone Types (Phone Types) 7.4
- Copy Model COS, Station, Button Map (Block Programming) . 7.5

NOTE: When you program the station features, always perform the Section 7.4, Telephone Types, *procedure before you perform the Section 7.5,* Square/Non-Square System (Button Mapping), *procedure.*

7.1 Programming Station Class Of Service Features

7.1.1 Account Codes *(Forced with Positive Verification)*

Description: After you have enabled the account code feature for the system, set its parameters, and programmed its list of account codes into the system (Section 10.3, *Account Codes*), use this procedure to turn the feature on for a station class of service and make it either forced or optional. If you make it a forced account code, the user must enter an account code before the system will let him or her dial the number for an outgoing call. Also, on incoming calls a user must enter an account code before the system will allow him or her to make any future outgoing calls. See Section 10.4, *Emergency Numbers*, for an exception to forced account code entry.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for account code and press ENTER.
6. Press SPACE BAR for feature setting.
7. When finished, press ESCAPE.
8. Press CONTROL N as necessary to display line number for forced account code and press ENTER.
9. Type item number for forced account code and press ENTER.
10. Press SPACE BAR for feature setting.
11. When finished, press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

7.1.2 Automatic Hold

Automatic Hold On Intercom Number

Description: The system automatically places a current inside call on hold when a station user presses an intercom button or line button other than the one for the active call.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Automatic Hold On Lines

Description: The system automatically places a current outside call on hold when a station user presses another line or intercom button.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.3 Background Music

Description: Music or other supplied audio information is available at a station through the telephone speaker and is turned on or off by the station user when he or she dials the appropriate codes. Use this procedure to assign background music to stations.
The music or information source is external to the common equipment and is customer supplied. The system will accept two music sources. You can use one source for this feature and the other source for the music on hold feature (Section 7.1.19, *Music Or Tone On Hold*).

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation:
Music source one: on = INTERCOM ✻ 11
off = INTERCOM # 1
Music source two: on = INTERCOM ✻ 12
off = INTERCOM # 1

7.1.4 Call Cost Display (Display Of Calls)

Description: If you have arranged for the system to employ call costing (Section 12.5, *Costing Information*), you can use this procedure to arrange for an LCD speakerphone to display the cost of a call made from that station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.5 Call Forward

Call Forward Of All, Personal, Busy, or Ring–No Answer (RNA) Calls

Description: Use this procedure to give users of an entire class of service of stations the ability to forward the calls that they receive at their stations to another station for answering. This feature allows these users to forward either all of the calls that their stations receive or just the calls they receive on their prime line and personal intercom number. Further, it can limit them to forwarding only the calls that their stations receive while it is busy or unattended (ring no-answer calls). If you choose this last option you will have to arrange the call forwarding default scheme at individual stations using the next procedure in this section titled, *Call Forward RNA, Ring (On) Busy.*

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. From the COS programming menu, select the class of service to be programmed and press ENTER.
5. From the COS programming menu, type the item number for the style of call forwarding that you wish to enable and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. Press ESCAPE and repeat steps 5 and 6 for other call forwarding types to be enabled.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 4–9 for each COS or press ESCAPE to end.

Operation:

All calls: INTERCOM ✻ 52 plus extension
Personal: INTERCOM ✻ 51 plus extension
Cancel: INTERCOM # 5

Call Forward RNA, Ring (On) Busy (Enhanced Call Forwarding)

Description: The call forward feature allows a station user to choose to receive several rings for RNA calls before the system forwards them. At default, the system immediately forwards calls that reach a busy station. You can take this programming action to allow calls to a busy station to ring in a subdued manner before they forward if the user chooses them to do so. This subdued ringing of calls to a busy station requires an idle intercom number at the busy station. Plus, if you have assigned group intercoms to the station, you must program them into a hunt list, using the Section 9.2.2, *Intercom Hunt List*, procedure, to ensure that this call forward feature will function properly.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR to enable feature (choose yes) and press ENTER
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Press ESCAPE and repeat steps 4–6 for other stations
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Operation: All calls: INTERCOM ✻ 54 plus extension
Personal: INTERCOM ✻ 52 plus extension
Cancel: INTERCOM # 5

Call Forward, Default Forward Type (For Busy Or Ring-No Answer Calls)

Description: Use this procedure to arrange the call forward default scheme for individual stations. With this feature, the system will automatically forward ringing calls to another station after a preset number of rings. Since this is an automatic forwarding of the calls, the station users do not have to take any action; however, any user-enabled call forwarding that they do take at their stations will override this automatic call forwarding.
This procedure determines answers for the following questions: can busy/RNA call forwarding take place at a station, to what intercom number will calls be forwarded to, and what type of calls will the system forward?
You must also program the number of rings that must occur before this automatic call forwarding can take place (Section 7.2.13, *Flexible Ringing Assignment).*

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR to enable feature(choose yes) and press ENTER for ITCM FWD To menu.
7. From the ITCM FWD To menu, type intercom number to receive forwarded calls and press ENTER for FWD Type.
8. Press SPACE BAR to enable either personal calls or all calls and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each station or press ESCAPE to end.

Recall Call Forward

Description: When you enable this feature for a station, any held, parked, and transferred calls that recall to a station while it is busy on another call follow the call forwarding path set up for that station.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu. type item number for feature and press ENTER.
6. Press SPACE BAR to enable feature (choose yes) feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.1.6 Call Park

Call Park Access

Description: Access to call park enables the station user to place as many as nine calls in park zones, or orbits, where they are retrievable by all system users.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation: Park call: INTERCOM ✻ 91 through ✻ 99 (for orbits 91–99)
Pick up parked call: INTERCOM # 91 through # 99.

Call Park Recall

Description: A call that is left in a park orbit longer than the length of time that you program with this feature will automatically return to a hold recall condition at the parking station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

7.1.7 Call Pick-Up

Call Pick-Up, Enable

Description: A station user can dial a code plus an intercom number of a ringing or on-hold station to answer the ringing call or to pick up a held call at that station. Turn this call pick-up feature on for a station class of service using this procedure. Remember, you must also assign this class of service to the station that you wish to have this feature.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation: INTERCOM ✻ 4 then dial intercom number of ringing or on hold station

Call Pick-Up Group

Description: Use this procedure to place a number of stations in a call pick-up group so that one station can answer a call ringing at any other station in the group.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type desired value for feature (1–16 = groups 1–16, 0 = no group) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

Operation: INTERCOM # 4

7.1.8 Call Waiting (Tone)

Description: Use this procedure to provide a station with the ability to send a tone signal to a busy called station. Refer to Section 7.1.11, *Camp-On Programming*, to enable basic camp-on ability at a station. Refer to Section 6.9.3, *Camp-On Tone*, to set the time duration of the call waiting tone.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.9 Tracker Access

Description: Assign Tracker access to a particular station intercom or group of intercoms using the following class of service (COS) programming. (The default is yes for COS1 and COS32.) Refer to Section 14.2, *Tracker Paging System Programming*, for further Tracker programming.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select Stations and press ENTER.
3. From stations menu, select COS Programming and press ENTER.
4. From COS programming, type class (1–32) and press ENTER.
5. From COS (class number) programming, select Tracker Access.
6. Toggle the SPACE bar to select yes/no and press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Press ESCAPE to end.

7.1.10 Enhanced LCD Display

Description: In systems operating with software releases prior to 8.B, when users receive intercom calls, their LCD-equipped telephone displays either the name of the calling station or its personal intercom number if the station does not have an assigned name.
With software release 8.B, you can take programming action that enhances the display of an LCD-equipped telephone so that it shows both the name of the calling station and its personal intercom number.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service that you wish to modify and press ENTER.
5. From COS programming menu, type row number that corresponds with Enhanced LCD Display and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

7.1.11 Camp-On Programming

Camp-On Originate, Camp-On Receive (Camp-On/Call Back)

Description: If a busy tone or a ring no-answer is encountered when one station calls another, the calling station user can initiate a camp-on to the busy station and wait for it to become idle or initiate an automatic callback when the called station becomes available. Use this procedure to enable this feature for a class of service of stations. Also, use the Section 7.1.8, *Call Waiting Tone*, procedure to enable a call waiting tone, and use Section following *Camp-On/Automatic Call Back Ring* and *Camp-On Tone* procedures to set the duration of the camp-on/automatic callback ring and the duration of a call waiting tone that the system sends to a busy station.

Programming: To arrange for station to initiate and receive camp-on to another station.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for camp-on initiate and press ENTER.
6. From COS programming menu, type item number for camp-on receive and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

Camp-On/Automatic Call Back Ring

Description: After you use the Section 7.1.8, *Call Waiting Tone*, procedure to enable a call waiting tone, use this procedure to set the duration of the camp-on/automatic ringback ring that the system sounds when it returns a camp-on call to the original station..

Programming:

1. Press CONTROL T for main menu.
2. Form main menu, select system and press ENTER.
3. From system menu, select system timing and press ENTER.
4. From the system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Camp-On Tone

Description: Use this procedure to set the duration of the call waiting tone that the system sends to a busy station.

Programming:

1. Press CONTROL T for main menu.
2. Form main menu, select system and press ENTER.
3. From system menu, select system timing and press ENTER.
4. From the system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

7.1.12 Do Not Disturb Programming

Do Not Disturb Inhibit

Description: This feature prevents a station from entering the do-not-disturb mode of operation.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Do Not Disturb Override

Description: This feature allows a station to override a do-not-disturb condition at another station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

Operation: Make intercom call, hear DND tones, dial ✻ 03

7.1.13 Exclusive Hold

Description: When you enable this feature, it prevents a telephone user at one station from picking up a call that someone placed on hold at another station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.14 Executive Override Programming

Executive Override (Enable or Disable)

Description: You can program a class of stations so its users have the ability to override a busy or a do not disturb condition at other stations.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation: Make intercom call, hear DND tones, dial S 03

Executive Override Block

Description: Use this procedure to arrange a station class of service that blocks executive overrides.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER..
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Periodic Executive Override Tone

Description: The executive advisory tone allows you to configure the system to provide an audible tone whenever a system user activates the executive override feature. You can enable this feature with a station class of service programming action (Section 7.1.48, *Executive Override Advisory Tone*) as either a one time tone or as a periodic reoccurring tone. If you choose a reoccurring tone, you must use the procedure herein to select the time interval between the reoccurring tones. Also refer to Section 6.10.19, *Location Code*.

Programming:
1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER,
4. From timing menu type item number for periodic conference tone and press ENTER,
5. Press SPACE bar to select desired time and press ENTER to select setting.
6. Press ESCAPE twice,
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

7.1.15 Idle Line Programming

Idle Line Preference

Description: With you enable this feature, a station automatically connects to an idle line when the user lifts the telephone's handset.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. Fro COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

Idle Line Priority

Description: If you use preceding *Idle Line Preference* procedure to give a station the ability to automatically connect to an idle assigned line when the user takes the handset off-hook, take this *Idle Line Priority* programming action to set the priority in which the system chooses the idle lines for use. You can place up to eight lines in this priority list.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type any eight line numbers 1–128 (type as n,nn,nnn or n–nnn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.1.16 IST Distinctive Ringing

Description: An industry-standard telephone can sound one ring cadence for intercom calls and a different ring cadence for outside calls or it can sound the same ring cadence for both types of calls. You must select one of these ringing styles on a station class of service basis. All industry-standard telephones with the same class of service have the same ringing style. See Section 7.2.35, *Industry-Standard Telephone Support*, for other industry-standard telephone programming requirements.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service assigned to the IST and press ENTER.
5. From COS programming menu, type row number for IST distinctive ringing and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

7.1.17 LCD Messaging

Description: This procedure enables a class of service messaging feature. It allows station users to set a message at their stations that will be displayed on calling LCD speakerphones. You can use the second part of this procedure to program the actual LCD messages. Alternately, The attendant can program the LCD messages using procedures found in the attendant guide.
Also refer to Section 6.3.2, *Message Deposit.*

Programming: To enable feature for class of service,
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. From COS programming menu Type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

To program LCD Messages,
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, type item number for feature and press ENTER.
4. From LCD messages menu, type selection (1–10) and press ENTER.
5. Type message and press ENTER. Message can be 16 characters long.
6. Repeat steps 4 and 5 for all messages. Press CONTROL N for more LCD message lines.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

7.1.18 Meet Me Answer Page

Description: When you enable this feature at a station, its user can dial a code in response to an all-call or zone page and meet the pager in a private conversation.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation: Press INTERCOM and dial 78.

7.1.19 Message Deposit *(Response Messaging)*

Description: This procedure enables a class of service messaging feature that allows station users to call an LCD speakerphone and arrange for a message to be left on its display. The message is for the called party to read if she or he is unable to answer the caller. Refer to Section 6.3.1, *LCD Messaging,* for details about programming the LCD messages that can be deposited. Also, you can use the procedure detailed in Section 7.3, *Square/Nonsquare System (Button Mapping By Station),* to assign a response message button to the telephone; however, users can do this for themselves if they need the button.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

7.1.20 Message Wait Originate (Message Waiting)

Description: When you enable this feature, a station user can dial a feature code to control the message waiting light at another station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation: Turn message waiting light on: press INTERCOM, dial ✻ 3.
Turn message waiting light off: press INTERCOM, dial # 3.

7.1.21 Music On Intercom Hold (Music Or Tone On Hold)

Description: With this feature enabled, the system supplies music, tone bursts or other audio information to callers while they are on hold. The music or information source is external to the common equipment and is customer supplied. Since the system accepts two music sources, you can use one source for this feature and the other source for the background music feature discussed in Section 7.1.3, *Background Music.*
When the system supplies tone bursts to callers while they are on hold, it sounds two .1 second long tone bursts separated by a 0.1 second interval of silence. It repeats this tone burst sequence every 5 seconds.

Programming: **For intercom number,**
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

For lines,
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. From line programming menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 4–7 for each line or press ESCAPE to end.

7.1.22 Paging Receive

Description: Use this procedure to give a class of service of stations the ability to receive voice announcements with the station handset and monitor speaker. For other paging requirements, refer to Section 6.11, *Paging Zone*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.23 Paging Transmit

Description: Use this procedure to give a class of service of stations the ability to transmit voice announcements to one or all other station handsets and monitor speakers. For other paging requirements, refer to Section 6.11, *Paging Zones*. Also refer to Section 6.9.5, *Paging Access*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

7.1.24 Ringing Preference *(Ringing Line Preference)*

Description: When you enable this feature, a station can automatically connect to a ringing line when a user takes his or her telephone off-hook. Refer to Section 7.2.13, *Flexible Ringing Assignments*, for other ringing considerations.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.25 Day Route Access/Night Route Access

Description: You must use Section 12.4, *Route Tables*, to build and assign automatic route selection (ARS) route tables before the system can perform ARS on a dialed number. Each of the six routes of a route table require a route access level of 1 to 4. ARS uses this route access level to determine if the dialing station has access to dial out on the route. It does this by comparing a station's route access level to the required dial out access level. If the station route access level is greater than or equal to the route access level that you assign to the route, the system allows the station to access the route. Otherwise, the system will not accept the dialed number, and sounds an error at the station's speaker or handset. The route access level allows some stations to gain access to the more costly routes in a route table while denying it to others. Just as you program each route from least to most costly, you must also arrange the station's route access level to increase from a low level to a high level. This is necessary because once the system denies access because of the access level, it will not try another route. The more costly the route is, the higher the access level needed to access it.
Use the following programming procedure to assign a route access level of 1 to 4 to a station class of service for both day and night operation.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for day route access and press ENTER.
6. Type 1–4 for restriction level.
7. Press ENTER for night route access level, and type 1–4 for restriction level.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.26 Day Restriction Level/Night Restriction Level

Description: Use restriction level programming (Section 11.4, *Restriction Level Programming*) to create as many as eight different toll calling categories based on the freedom to dial various numbers or the restriction from dialing them. You can assign one of eight different restriction (1–8) levels or assign an *allow all* level or a *deny all* level. Level 8 is the least restrictive from a station viewpoint but the most restrictive from a restriction table viewpoint. (For example, a station with a restriction of 8 is only restricted from dialing *always deny* numbers and it can dial numbers with restriction levels of 1–8. A station with a restriction level of 1–7 cannot dial a number with a toll restriction table entry of 8.) The *allow all* entry ensures that the system applies no dialing restriction to a number (example: 911). The *deny all* ensures that station user can never a number (example: 1–900).
Use the following procedure to assign a restriction level to a station class of service. Program the restriction level value that accurately reflects the toll restriction dialing freedom expected by telephones with this class of service.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for day restriction level and press ENTER.
6. Type 1–8 for restriction level.
7. Press ENTER for night restriction level, and type 1–8 for restriction level.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.27 System Speed Dial Groups

Description: The system provides 200 system speed dial numbers. These numbers are divided into 20 groups with 10 numbers available in each group. Assign none, one, or a range of groups (n - nn) to each station class of service. Refer to Section 6.7, *Speed Dial Programming*, for additional speed dial considerations.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Type desired value (1–20) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation: While on hook, dial 0–9 or press other speed dial buttons.

7.1.28 Station Monitoring

Description: When you enable this feature, the busy lamp field (BLF) light of an associated direct station select select (DSS) button provides a visual indication of idle, busy, and ringing status of the station it represents. A station user can press this DSS button to make a one-button pick-up of a ringing station. When you disable this feature, the BLF shows only idle and busy conditions of the DSS station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.29 Directed Station Hold

Description: This feature, when enabled, allows station users to pick up the last call a user placed on hold at another station. This feature does not allow users to pick up exclusive hold calls or calls that are in the process of being transferred. Also, the feature does not allow users to send a directed call hold to a station where its user is scanning the currently held calls. In addition, this feature allows users to place a call on hold at another station and have this call appear to be the one that has been on hold there for the longest time. Features such as hold recall apply to the station that sent the directed call hold and not to the station that received the directed call hold.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation:
Directed Hold: INTERCOM ✻ 90 then dial intercom number of destination station
Directed Pickup: INTERCOM # 90 then dial intercom number of station where call is on hold

7.1.30 Remote Station Disable

Description: Software release 6.A provides this feature that, when enabled, allows users at stations with the proper class of service to dial a code and remotely disable or enable another station. Normally, you should give this capability to the system attendant but you can assign it to any class of service that is appropriate.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation:
Disable Station: INTERCOM ✻ 05, then dial intercom number of station
Enable Station: INTERCOM # 05, then dial intercom number of station

7.1.31 Remote Day Exception Number/Night Exception Number

Description: A DISA caller may have access to an outside line where the toll restriction is based on the DISA authorization code that is associated with a particular class of service. Remote day and remote night exception numbers allow DISA callers to dial numbers that their toll restriction normally prevents them from dialing. If a toll restriction table exception number matches one of the exception numbers that you assign using this procedure, the system allows the DISA caller to dial the number.
The exception number values that you can assign are 1 through 32 and NONE. You can assign 32 exception numbers to each DISA class of service. You also must assign one exception number to each toll restriction table line entry (Section 11.7, *Exception Number Programming*). Refer to Section 8.8, *Direct Inward System Access (DISA) Programming*, for DISA programming details.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for day exception number and press ENTER.
6. Type day exception number (0–32) (n, nn, n–nn, or 0 for none) and press ENTER.
7. Repeat step 6 for night exception number.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.32 Conference Advisory Tone

Description: The conference advisory tone feature allows you to configure the system to provide an audible tone whenever more than two parties are connected in a conference call. You can select this tone as either a one time tone or as a periodic reoccurring tone. If you choose a reoccurring tone, you must use the section 6.9.23, *Periodic Conference Tone*, procedure to select the time interval between the reoccurring tones. Also refer to Section 6.10.19, *Location Code*.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type CTRL-N to get to the page with the selection for conference advisory tone.
6. Select conference advisory tone and press ENTER.
7. Press SPACE bar to toggle your options.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE to end.

7.1.33 Executive Override Advisory Tone

Description: The executive advisory tone allows you to configure the system to provide an audible tone whenever a system user activates the executive override feature. You can select this tone as either a one time tone or as a periodic reoccurring tone. If you choose a reoccurring tone, you must use the Section 6.9.24, *Periodic Executive Overriding Tone*, procedure to select the time interval between the reoccurring tones. Also refer to Section 6.10.19, *Location Code*.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type CTRL-N to get to the page with the selection for executive override advisory tone.
6. Select executive override advisory tone and press ENTER.
7. Press SPACE bar to toggle your options.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE to end.

7.1.34 Line Answer

Description: This feature provides station access to a line for call answering purposes for an entire class of service of stations. Also refer to Section 7.1.33, *Line Originate.* You must turn on both that feature and this *Line Answer* feature for a line to be fully usable.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add, r for remove and press ENTER.
8. Type line port 1–128 (type as n,nn,nnn or n–nnn) to be removed or added and press ENTER.
9. Press ESCAPE three times.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each COS or press ESCAPE to end.

7.1.35 Line Originate

Description: This feature provides station access to a line for call originating purposes for an entice class of service of stations. Also refer to Section 7.1.32, *Line Answer*. Both that feature and this one must be turned on for a line to be fully usable.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add, r for remove and press ENTER.
8. Type line port 1–128 (n, nn,nnn or n–nnn) to be removed or added and press ENTER.
9. Press ESCAPE three times.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.36 Periodic Line Tone

Description: This when enabled, provides periodic warning tones to station users while they are busy on certain lines. The warning tone consists of one 500 ms burst, a 100 ms off period, and one 100 ms burst. The tone reminds the users to keep their conversations short on these lines. You can enable this feature for a class of service of telephones and then specify the particular lines that you deem applicable. Further, you can select how often the tone sounds. Also refer to Section 7.1.35, *Maximum Call Duration*, for a related feature.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add, r for remove and press ENTER.
8. Type line port 1–128 (n, nn,nnn or n–nnn) to be removed or added and press ENTER.
9. Press ESCAPE three times.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–8 for each COS or press ESCAPE to end.

Periodic Line Tone Time

Description: After you enable the periodic warning tones that remind users to keep conversations short on certain outside lines, use this procedure to set how often that you wish the periodic warning tones to occur

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

7.1.37 Maximum Call Duration

Description: The system provides the maximum call duration feature. This feature, when enabled, automatically cuts off calls on certain lines after a preprogrammed time. The system will not cut off calls made to an emergency number (Section 10.4, *Emergency Numbers*). The system sounds a warning tone at the busy station 10 seconds before it disconnects the call. The warning tone consists of one 800 ms burst followed by eight 100 ms bursts. Also refer to Section 7.1.34, *Periodic Line Tone*, for a related feature.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add, r for remove and press ENTER.
8. Type line port 1–128 (n, nn,nnn or n–nnn) to be removed or added and press ENTER.
9. Press ESCAPE three times.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–8 for each COS or press ESCAPE to end.

Maximum Call Duration Time

Description: After you enable the maximum call duration feature, use this procedure to set the cut off time.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select systems and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

7.1.38 Line Group Access

Description: Use this procedure to give a station access to line groups. Refer to Section 8.2, *Line Group Programming*, for other line group considerations.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Type line groups (1–16, 0 = none, type as n,n,nn or n–nn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.39 Line Group Queue

Description: Use this procedure to give a station the ability to queue for an idle line in a line group. Refer to Section 8.2, *Line Group Programming*, for other line group considerations.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select COS programming and press ENTER.
4. From the COS programming menu, type item number for feature and press ENTER.
5. When finished, press ESCAPE twice.
6. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
7. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.40 Line-To-Line Transfer *(Unsupervised Conference)*

Description: This programming feature gives a station the ability to set up an unsupervised conference between two lines.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Line-To-Line Connect Duration

Description: After you have given a station the ability to set up an unsupervised conference between two lines, use this procedure to set the maximum amount of time that an unsupervised conference can continue between two lines. When the time out occurs, the system recalls the station from where the user enabled the unsupervised conference.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

7.1.41 Voice Announce Block

Description: When you enable this programming feature a station has the ability to block voice announced internal signalling when its user dials the proper code.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Operation: On: INTERCOM ✻ 2
Off: INTERCOM # 2

7.1.42 Internal IST Flash

Description: If industry-standard telephone users access an outside line using the line group feature and then quickly press and release (flash) the telephone's hookswitch, the IST will react in one of two different ways depending upon how you program this feature. Refer to Section 7.2.35, *Industry-Standard Telephone Support* for other IST programming considerations.

- □ **With the internal IST flash feature disabled**, IST users can flash the hookswitch while on an outside line and generate a hookflash signal on the outside line; however, they cannot flash the hookswitch to obtain intercom dial tone. (The Section 7.2.35 procedure sets the hookflash signal time. This signal time determines whether the IST hookflash signal is long enough to recall the outside line dial tone or short enough to access the outside line host system features. Refer to the CO specifications for actual timing requirements.)
- □ **With the internal IST flash feature enabled**, IST users can flash the hookswitch while on an outside line and obtain intercom dial tone; however, if they need to generate a hookflash signal on the outside line, they must flash for intercom and then dial S 08.
  Dialing S 08 over the intercom, generates an outside line hookflash signal and returns the telephone to the outside line.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service assigned to the IST and press ENTER.
5. From COS programming menu, type row number for IST distinctive ringing and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

7.1.43 Forced Account Codes

Description: After you have enabled the account code feature for the system, set its parameters, and programmed its list of account codes into the system, turn the feature on for a station class of service and make it either forced or optional. If you make it a forced account code, the user must enter an account code before the system will let him or her dial the number for an outgoing call. Also, on incoming calls a user must enter an account code before the system will allow him or her to make any future outgoing calls. See Section 10.3, *Account Codes* for other account code programming considerations and to Section 10.4, *Emergency Numbers* for an exception to forced account code entry.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for account code and press ENTER.
6. Press SPACE BAR for feature setting.
7. When finished, press ESCAPE.
8. Press CONTROL N as necessary to display line number for forced account code and press ENTER.
9. Type item number for forced account code and press ENTER.
10. Press SPACE BAR for feature setting.
11. When finished, press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

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7.1.44 Allow Busy Display (Display Of Busy Status)

Description When you activate this feature, users calling a busy station from an LCD speakerphone can read the busy status of the called station on the telephone's display. (for example, Busy with line 2). With the feature inactive, the display shows busy but does not reveal the busy status.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

7.1.45 Clear Major Alarm Ring

Description: This feature allows users to clear the major alarm ring condition from a telephone station. To make this feature available to users, you must first program a class of service as described below and then assign that class of service to the user's telephone station.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type CTRL-N to get to the page with the selection for clearing the major alarm ring.
6. Select clear major alarm ring and press ENTER.
7. Press SPACE bar to toggle between yes or no.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE to end.

Operation Clear major alarm ring condition: INTERCOM #90

7.1.46 High Handset Volume *(On Impact Telephones)*

Description: You can program the handset volume feature on Impact telephones to offer the station user more choices in selecting the handset volume level locally from his or her telephone. Normally, users have up to 8 volume levels that they can select. However, when you program the high level, the user's handset volume choices increase to 13.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type CTRL-N to get to the page with the selection for high level handset volume.
6. Select high level handset volume and press ENTER.
7. Press SPACE bar to toggle between yes or no.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE to end.

Operation: While on a call, press VOLUME UP or VOLUME DOWN once for each change of volume. To set loudness default to a certain level,
– lift handset,
– adjust loudness using VOLUME UP or VOLUME DOWN,
– press INTERCOM and dial ✻✻7,
– hang up.

7.1.47 Restrict ARS Hookflash (Automatic Route Selection, Hookflash Restriction)

Description: This feature enhances ARS response to hookflash action on an outside line when that action is followed by dialed digits. With the feature enabled, the system delays response to a hookswitch flash until after the ARS feature verifies as valid all subsequent dialed digits. With the feature disabled, the system sends the hookflash over the line without waiting for the ARS feature to verify the validity of subsequent dialed digits. This station class of service feature is applicable only when the ARS feature is active.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service that you wish to modify and press ENTER.
5. From COS programming menu, type row number that corresponds with Restrict ARS Hookflash and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

7.1.48 Quick Transfer

Description: The quick transfer feature allows users to perform an automatic screened or unscreened transfer of an incoming line call without pressing their telephone's TRANS/CNF button. The transfer occurs automatically as soon as the user who answers the call dials the intercom number or access code for the transfer location. The system begins the call transfer process as soon as the user dials a digit on his or her dial pad, and effects the transfer as soon as the user hangs up or presses his or her telephone's RELEASE button. When this feature is active, it greatly reduces the keystrokes that users must take to transfer calls over a tie line.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service that you wish to modify and press ENTER.
5. From COS programming menu, type row number that corresponds with Quick Transfer and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

7.2 Programming Station Features

7.2.1 Personal Intercom Number

Description: Use this programming procedure to change the station's personal intercom number. Also refer to Section 9.1, *Modifying Intercom Numbers*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for personal intercom and press ENTER.
6. Type personal intercom number and press ENTER. The system indicates if a number conflict exists and prompts you to select another number or take appropriate action.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.2 Display Name/Full Name *(Station Name)*

Description: You can assign a display name and a full name to a station. A display name is composed of a maximum of seven characters and shows in the display of an LCD speakerphone as a identification aid. A full name is composed of a maximum of 20 characters and shows in some voice mail and open architecture interface applications. You can compose a valid name from any alpha-numeric character; however, the first character of a display name must be an alphabetic character.
You can also add station names by following the procedure described in Section 9.1, *Modifying Intercom Numbers*..

Programming: To assign a name to a station,
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for display name and press ENTER.
6. Type display name (a–z, A–Z, 0–9, punctuation, special characters, and so forth) and press ENTER.
   A display name can be up to seven characters long.
7. Type full name (a–z, A–Z, 0–9, punctuation, special characters, and so forth) and press ENTER.
   A full name can be up to 20 characters long.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 4–8 for each station that requires a name or press ESCAPE to end.

7.2.3 Class Of Service

Description: You can assign a group of preprogrammed class of service station features to a station. The system makes up to 32 different classes of service available, and you can program the feature values differently in each one.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type desired value for feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.4 Speed Dial Sets

Description: A speed dial set is a group of 10 speed dial locations. The system allocates three speed dial sets to each telephone as a default but you can allocate up to 10 sets to a telephone if you wish. When a DSS/BLF console is operated as a companion to a telephone, you can allocate speed dial sets at the companion telephone that the system will then share with the console. The system reserves one speed dial set for the telephone's dial pad buttons 0–9. For other speed dial considerations, see Section 6.7, *Speed Dial Programming*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type desired value for feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.5 Idle Line Priority

Description: If you use Section 7.1.13, *Idle Line Preference,* to give a station the ability to automatically connect to an idle assigned line when the user takes the handset off-hook, take this programming action to set the priority in which the system chooses the idle lines for use. You can place up to eight lines in this priority list.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type any eight line numbers 1–128 (type as n,nn,nnn or n–nnn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.6 Intercom Hunt List

Description: Place personal intercom and group intercom numbers in a list with this programming procedure. Calls to a busy hunt list number will search the list for an idle number at which to ring. Up to eight intercom numbers are allowed in a hunt list. These can be all group intercom numbers or one personal intercom number and seven group intercom numbers. See Section 9, *Programming Intercom Numbers,* for other intercom number considerations.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type intercom numbers for list (up to eight allowed separated with commas - include the personal intercom of station being programmed for intercom call hunting; otherwise, only line calls to the station will hunt) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.7 Group Intercom Access

Description: Use this procedure to add group intercom numbers to stations for their use. Also refer to Section 7.3, *Square/Nonsquare System–Button Mapping By Station*, to map buttons for group intercom number selection. See Section 9, *Programming Intercom Numbers* for other intercom number considerations.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type a for add or r for remove and press ENTER.
7. Type group intercom numbers (type nnnn,nnnn, nnnn or type nnnn–nnnn) and press ENTER.
8. When finished, press ESCAPE three times.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 4–9 for each station or press ESCAPE to end.

7.2.8 Prime Line Programming

Prime Line Type

Description: When you enable this feature, the station automatically selects a line, line group, or intercom number for use when the station user takes the station off hook. Use the programming procedures shown below to select the line port, line group, or intercom number to serve as the prime station calling interface.

*NOTE: You can create an **intercom hot line telephone** by taking special programming action when you assign a prime intercom number. Refer to the paragraph titled* Prime Intercom Number *in this section for details.*

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for desired value and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

Prime Line

Description: Use this procedure to choose the prime line.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or station name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. From prime line menu, type 1–128 press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

Prime Line Group

Description: Use this procedure to choose the prime line group.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or station name and press ENTER.
5. From station programming menu, select prime line group and press ENTER.
6. From prime line group menu, type 1–16 and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

Prime Intercom Number

Description: Use this procedure to choose the prime intercom number.

NOTE*: You can create an* ***intercom hot line telephone*** *by assigning one telephone's personal intercom number as the prime intercom of another telephone. When the user takes this programmed telephone off hook, it automatically calls the other telephone.*

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or station name and press ENTER.
5. From station programming menu type item number for feature and press ENTER.
6. From prime intercom menu, type personal intercom number and press ENTER.

   NOTE*: Remember, with this step, you can create an* ***intercom hot line*** *by typing a personal intercom number of another telephone.*
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.9 Tone Or Voice Signalling (Tone First)

Description: Intercom calls are either tone or voice signalled as a first choice with the other mode available as a second choice. Use this procedure to select the first choice in intercom signalling on a per station basis.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for feature value and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.10 Call Announce Beeps (Call Announce Tone Bursts)

Description: You can set the number of call announce tone bursts to be a value of from one to five and you can do this for each station in the system.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name for station you wish to program and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type choice (1–5) and press ENTER.
7. Press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–9 for each station or press ESCAPE to end.

7.2.11 Default Forward Type

Description: Use this procedure to arrange the call forward default scheme for individual stations. With this feature, the system will automatically forward ringing calls to another station after a preset number of rings. Since this is an automatic forwarding of the calls, the station users do not have to take any action; however, any user-enabled call forwarding (Section 7.1.5, *Call Forward)* that they take at their stations will override this automatic call forwarding. This procedure determines whether or not intercom busy/RNA call forwarding can take place at a station. You must also program the number of rings that must occur before this automatic call forwarding can take place (Section 7.2.13, *Flexible Ringing Assignment)*.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR to enable feature (choose ITCM FWD) and press ENTER.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 4–10 for each station or press ESCAPE to end.

Intercom Number Forwarded To

Description: Use this procedure to assign the intercom number of a station to receive another station's forwarded calls.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name for station you wish to program and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type intercom number for forward to station and press ENTER.
7. Press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–9 for each station or press ESCAPE to end.

Forward Type (For Busy Or Ring - No Answer Calls)

Description: Use this procedure to arrange what type of calls will forward from the station. You must also program the number of rings that must occur before this automatic call forwarding can take place (Section 7.2.13, *Flexible Ringing Assignment)*.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR to enable either personal calls or all calls and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–9 for each station or press ESCAPE to end..

7.2.12 Forward RNA Ring Busy *(Enhanced Call Forwarding)*

Description: The call forward feature allows a station user to choose to receive several rings for RNA calls before the system forwards them. At default, the system immediately forwards calls that reach a busy station. You can take this programming action to allow calls to a busy station to ring in a subdued manner before they forward if the user chooses them to do so. This subdued ringing of calls to a busy station requires an idle intercom number at the busy station. Plus, if you have assigned group intercoms to the station, you must program them into a hunt list, using the Section 9.2.2, *Intercom Hunt List*, procedure, to ensure that this call forward feature will function properly at station. Refer to Section 7.1.5, *Call Forward*, for other call forwarding considerations.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR to enable feature (choose Yes) and press ENTER
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Press ESCAPE and repeat steps 4–6 for other stations
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Operation: All calls: INTERCOM ✻ 54 plus extension
Personal: INTERCOM ✻ 52 plus extension
Cancel: INTERCOM # 5

7.2.13 Flexible Ringing Assignments

Program ringing assignments on a per station/per line/per intercom number basis. Ringing can be immediate, delayed, or special purpose. Use the procedures in this section to customize the ringing features for the system. If needed, use the Section 6.11.7, *Relays (Line Answer From Any Station)* procedure to arrange for a relay to track the ringing of the direct, delayed, day 1, day 2, or night ringing modes (use Section 6.10.18, *Day 1, Day 2, And Night Ringing Begin And End Times* to program these ringing modes). Plus, if your installer connects customer-supplied external paging equipment to the system's external paging port, use the Section 6.11.6, *Relays (External Paging Equipment Control*), procedure to arrange for that equipment to sound the ring signal of any or all lines.

Direct Ringing

Description: Use this procedure to choose the line ports that you want to ring at a station as soon as a call appears. Direct ringing sounds during the day 1 and day 2 time periods but does not ring during the night ringing mode or during the manual night transfer (of ringing) operation.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type the item number for feature and press ENTER.
6. Press CONTROL E for edit.
7. Type a for add or r for remove and press ENTER.
8. Type line port number 1–128 (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11 Repeat steps 4–10 for each station or press ESCAPE to end.

Delayed Ringing

Description: Use this procedure to choose the line ports that you want to ring at a station after waiting a short time period from when a call appears. Delayed ringing sounds during day 1, day 2 time periods, during the night ringing mode, and during the manual night transfer (of ringing) operation.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add or r for remove and press ENTER.
8. Type line port number 1–128 (type as n,nn,nnn or n—nnn) and press ENTER.
9. When finished, press ESCAPE twice.

Day 1 Ring

Description: Use this procedure to choose the line ports that you want to ring at stations during the day 1 ringing mode time period. Refer to the paragraph below titled, *Day 1, Day 2, and Night Ringing Begin and End Times,* to set the beginning and ending times of this ringing.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
7. Type a for add or r for remove and press ENTER.
6. Press CONTROL E to edit.
8. Type line port number 1–128 (n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each station or press ESCAPE to end.

Day 2 Ring

Description: Use this procedure to choose the line ports that you want to ring at stations during the day 2 ringing mode time period. Refer to the paragraph below titled, *Day 1, Day 2, and Night Ringing Begin and End Times,* to set the beginning and ending times of this ringing.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E to edit.
7. Type a for add or r for remove and press ENTER.
8. Type line port number 1–128 (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each station or press ESCAPE to end.

Day 1, Day 2, And Night Ringing Begin And End Times

Description: With this programming procedure, set the begin and end times of the day 1, day 2, and night ringing time periods.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From the system parameters menu, select day 1, day 2 or night ringing begin times and press ENTER.
5. Type times in 24–hour format (hh:mm) and press ENTER.
6. Press ENTER (repeatedly if needed) to place cursor at next time desired setting.
7. Repeat step 5 and press ENTER.
8. Repeat steps 6 and 7 until all times are set and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each station or press ESCAPE to end.

Night Ring *(Night Transfer—Of Ringing)*

Description: Choose the line ports that you want to ring, along with the delayed ringing line ports, at stations during the night ringing mode of operation. The ringing arrangement that you configure here is the arrangement that is active both during the automatic night ringing time period and whenever the attendant manually activates the night transfer (of ringing) operation. Do note that the attendant commanded night ringing period supersedes the automatic night ringing period. Refer to the above paragraph titled, *Day 1, Day 2, and Night Ringing Begin and End Times,* to set the time for the automatic night ringing period.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add or r for remove and press ENTER.
8. Type line port number 1–128 (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each station or press ESCAPE to end.

Operation: From an attendant station, On: INTERCOM ✻ # 0 ✻ 031
Off: INTERCOM ✻ #0 ✻ 032

Caller ID Ring No-Answer (RNA)

Description: This feature offers telephone users the ability to review calls that ring at their stations while they are away. The system stores caller ID RNA records and allows users to review them and use one-button dialing to return those calls that need returning. The feature also denotes the identification of the last station that reviewed the records thus helping prevent multiple call backs to the same number. After users review the caller ID RNA records, the system deletes the records from their telephones yet retains them in the SMDA storage so that they can look at them later if they must. For complete caller ID programming, refer to Section 14.1, *Caller ID Programming.*

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name for station you wish to program and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E for edit table.
7. Type *a* to add or *r* to remove and press ENTER.
8. Enter caller ID line port numbers 1–128 (enter n, nn, nnn or n–nnn) to serve feature at this station and press ENTER.
9. Press ESCAPE three times.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–9 for each station or press ESCAPE to end.

Ring No-Answer Rings

Description: This procedure sets the amount of rings that sound at one station port before the call rolls over to ring at another station port. Any system feature that requires a ring no-answer value (for example, call forwarding) uses the setting that you program here.
The system defaults the ring no-answer value at regular station ports to four rings, and it defaults ports programmed to function as voice mail ports to three rings. This insure that, at default, the voice mail equipment will have sufficient time to answer a call before it rolls over to the next port.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type number of rings 0–6 and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

Personalized Ringing Tone

Description: Program a station to ring in one of several distinctive tones for proprietary digital telephones and in one of four distinctive tones for analog telephones. While industry-standard telephones do not provide personalized ringing, you can set distinctive ringing for them using the Section 7.2.35, *Industry-Standard Telephone Support*, procedure.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu, type item number for feature and press ENTER.
6. Type ring tone choice and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

Operation: INTERCOM ✻ ✻ 4 then dial ring code (1–8)

7.2.14 LCD Contrast (Digital Telephones—Only)

Description: Adjust the intensity of the display on digital LCD speakerphones with this procedure. The user can also change the display contrast at his or her telephone using instructions provided in the system user's guide.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type 1–8 and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

Operation: INTERCOM ✻ ✻ 51–58

7.2.15 Service Observing

This feature allows a station to enter an in-progress call in an unannounced, muted mode to monitor the conversation. Use this procedure to give a station service observe capability and make other stations available for service observing.

Initiating Service Observe

Description: Allow a station to perform a service observe operation.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for feature value and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

Operation: INTERCOM # 03 then dial the extension

Making A Station Service Observable

Description: Allow a station to be service observed.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for feature value and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.16 Day Exception Number/Night Exception Number

Description: Exception numbers allow stations to dial numbers that they are not normally allowed to dial by their automatic route selection/toll restriction levels. If the toll restriction table exception number matches one of the exception numbers that you assign to the station using the following procedure, the station is allowed to dial the number.
The exception number values that you can assign are 1 through 32 and NONE. You can assign 32 exception numbers to each station. You also must assign one exception number to each toll restriction table line entry (Section 11.7, *Exception Number Programming*).

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type intercom number or name of station.
5. From station programming menu, type item number for Day (or Night) exception number.
6. Type exception numbers 0–32 (n,nn or n–nn) or type 0 for none.
7. Press ENTER for Night (or Day) exception number and repeat step 6.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE to end.

7.2.17 SOHVA Beeps (SOHVA Tone Bursts)

Description: You can choose the number of tone bursts that each telephone user hears preceding a SOHVA message to be from one to six.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name for station and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type choice (1–6) and press ENTER.
7. Press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–9 for each station or press ESCAPE to end.

7.2.18 SOHVA Groups

Description: SOHVA calling groups control the pattern in which station ports receive and/or originate SOHVA calls to one another. You must first form the SOHVA groups (Section 6.6.3, *SOHVA Groups*) and then assign the groups to individual stations with the following procedure.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. Type item number for feature and press ENTER.
6. Type group number 0–16 (n,nn or n-nn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

7.2.19 Busy On SOHVA

Description: At default, the system returns a ring back tone to users who make SOHVA calls to busy stations; however, this procedure allows you to arrange for telephone users to receive a busy signal instead of the ring back tone. This feature lets non-LCD telephone users know that a called station is busy.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.20 Pick-Up Groups

Description: Use this procedure to place a number of stations in a call pick-up group so that one station can answer a call ringing at any other station in the group.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type desired value for feature (1–16 = groups 1–16, 0 = no group) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Operation: INTERCOM # 4

7.2.21 Through Dialing *(Thru-Dialing)*

Description: This procedure allows DTMF tones that are generated by an external device connected to the system through necessary interface equipment to pass through the system and out to any line connection.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9 . Repeat steps 4–8 level for each station or press ESCAPE to end.

7.2.22 Single Line Tap (Single Line Proprietary Telephone TAP Button)

Description: Use this procedure to set the function of the TAP button on single line proprietary telephones.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 4–8 level for each station or press ESCAPE to end.

7.2.23 Ringing On Busy (Enhanced Subdued Ringing)

Description: When a telephone is busy on a call and another call comes to that telephone, the system subdues the ringing of the second call to a lower volume but allows the call to continue to ring at this subdued volume until the caller abandons it. The system shortens the ringing of another call to model 8024S, 8124S, 8012S, and 8112S speakerphones that are busy in the speakerphone mode to one quick tone burst; however, if these telephones are busy in an off-hook manner (non-speakerphone mode), the system still subdues the ringing of the second call to a lower volume and allows the call to continue to ring at this subdued volume until the caller abandons the call.

If a user does not wish to hear subdued ringing while he or she is busy on a call (even the one quick tone burst on those particular models that provide it) you can take this programming action to eliminate all ringing by a second call.

Programming:
1. Press CONTROL T to return to the main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type the personal intercom number or the previously assigned name and press ENTER.
5. From station programming menu, type the item number for feature and press ENTER.
6. Press SPACE BAR to eliminate ringing on busy (set option to no) and press ENTER.
7. When finished press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

7.2.24 Allow Ringer Off (Ringer Volume Off)

Description: On some proprietary telephones, the user selects the ringer volume level by pressing a rocker-type volume control repeatedly to select one of four different volume levels. The lowest volume setting is essentially an off condition as the telephone sounds only one low-volume ring burst when a call rings the station.
Sometimes users would rather not receive even one ring burst. For these cases, program the system so that it completely silences the ringer at a telephone when its user selects the lowest volume setting.

Programming:
1. Press CONTROL T to return to the main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or the previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR to turn ringer off (set option to yes) and press ENTER.
7. When finished press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

7.2.25 Disabled (Station Disable)

Description: Disable a station port with this feature. Refer to Section 7.4, *Telephone Types*, for the procedure for marking the station port as undefined after you disable the port. Use the Section 7.1.30, *Remote Station Disable*, procedure to give a station the capability to disable other stations.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.26 Consoles Installed (DSS/BLF Consoles Installed)

Description: Use this procedure to assign DSS/BLF consoles to a station and to identify the ports that the consoles occupy.

NOTE: Before you can assign a console and name the console port with this programming step, you must use the Section 7.4, Telephone Types, programming procedure to identify the type of console and the station port to which it is assigned.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. Type item number for the consoles installed and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. Type item number for console ports and press ENTER.
8. Type the port number for console ports (1–192, 0 for none—up to four allowed) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each station or press ESCAPE to end.

7.2.27 Programming Port (Database Programming Station)

Description: This procedure assigns limited database programming ability to a station.

NOTE: You must ensure that there is an LCD speakerphone connected to the station port that you choose with this feature.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station and press ENTER.
5. From station programming menu, type item number for the feature and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 level for each station or press ESCAPE to end.

7.2.28 Automatic Transfer On Busy

Description: You can enable automatic attendant transfer on busy for individual station ports if you wish. With this feature enabled, the system will ring a busy telephone when the voice mail system is attempting to transfer a call to it thus giving the user the option of leaving his or her present call and taking the new one. With the feature disabled, the busy telephone is not signalled by the presence of a new call and the voice mail system will automatically route it to the busy telephone's voice mail box. For complete voice mail programming, see Section 14.5, *Voice Mail Programming*.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. When finished press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.29 Headset

Description: This procedure enables the use of a headset at a telephone.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.30 Attendant Position (Alternate Attendant, Overflow Attendant)

Description: The attendant position station provides incoming call direction, and controls system-wide operating features. Additionally, the attendant position is responsible for certain programming features. The system defaults two stations as attendant positions (101 and 102) but it does not limit the number of attendant positions that it can support. Also refer to Section 6.10.13, *Operator Station*.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu. type item number for feature and press ENTER.
6. Press SPACE bar for setting and press ENTER.
7. Type personal intercom number for alternate attendant (if needed) and press ENTER.
8. Type personal intercom number for overflow attendant (if needed) and press ENTER.
9 . When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each attendant position or press ESCAPE to end.

7.2.31 Extended DTMF Dialing

Description: You can enable the extended DTMF length dialing feature on a per station basis with this programming procedure. The system generates DTMF tones of extended length when users take their telephones off-hook and then wait until after the system sounds the *extended dialing tone burst* before they engage automatic dialing. This feature also allows an analog station to generate extended DTMF tones when its user manually dial numbers at the telephone's dial pad after hearing an *extended dialing tone burst*. Since digital telephones generate a DTMF tone for as long as the user holds the dial pad button down during manual dialing, this feature is only applicable on automatically dialed numbers at digital telephones. Refer to the following paragraph for the procedure that sets the time length of the DTMF tone.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–10 for each station or press ESCAPE to end.

DTMF Extended Dialing (Tone Length)

Description: Use this programming feature to set the length of the DTMF tones. The system generates DTMF tones of extended length when users take their telephones off-hook and then wait until after the system sounds the *extended dialing tone burst* before they engage automatic dialing (for example, press speed dial buttons or saved number redial button) at their stations. Also, if analog telephone users take their telephones off-hook and then wait to begin manually dialing until after the system sounds the *extended dialing tone burst*, the system will extend the length of the manually dialed DTMF tones. After setting this extended DTMF tone length, you must enable the feature's use at each station where it is needed by performing the *Extended DTMF Dialing* procedures shown above..

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER.
4. From the system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

7.2.32 Softkeys Setup (Interactive Button Support)

Description: The system provides support for interactive buttons on LCD speakerphones with product codes of 7010S and 7016S (all revisions), and 7700S (revision H and earlier). The three interactive buttons and the associated expanded displays provide quick, easy access to system features and straight-forward button programming without the need for dialing codes. At default, the interactive button support is disabled; therefore, you must take programming action to enable it. When you enable them, the system overrides any previous mapped function at the buttons with this new assignment. If, after you have enabled the support, you take new action to button map any of the interactive buttons to another assignment, the new assignment will take effect at that button. In addition, the system will clear the remaining two buttons and disable the interactive button support. If you replace any of these LCD speakerphones with a non-display telephone, the system recognizes it as such and does not assign interactive buttons to it. Since the system allows you to enable interactive buttons with station programming action, it does not provide a means for assigning interactive buttons with the button mapping procedure. After you have enabled the interactive buttons, you can look at the button assignments with the button mapping procedure, and note that the system identifies them as SOFT1, SOFT2, and SOFT3.

Programming:

1. Press CONTROL T to return to the main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or the previously assigned name and press ENTER.
5. From station programming menu, type the item number for feature and press ENTER.
6. Press SPACE BAR to enable interactive buttons (set option to “yes”) and press ENTER.
7. When finished press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

7.2.33 IST Hold Confirmation

Description: Industry-standard telephones sound a special hold confirmation tone when their users place calls on hold. Prior to this software release, these telephones returned to intercom dial tone when their users placed calls on hold. The system defaults with the special confirmation tone enabled; however, you can disable the feature if you wish. The confirmation tone is three 80 ms. on –80 ms. off tone bursts repeated at 800 ms. intervals. See Section 7.2.35, *Industry-Standard Telephone Support* for other IST programming considerations.

Programming:

1. From main menu, select stations and press ENTER.
2. From stations menu, select station programming and press ENTER.
3. Type personal intercom number or previously assigned name for IST and press ENTER.
4. From the station programming menu, type item number for feature and press ENTER.
5. Press SPACE bar to enable or disable feature (yes = enable, no = disable) and press ENTER.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 3–7 for each station or press ESCAPE to end.

7.2.34 Transfer Ring Cadence

Description: A telephone user can select the ringing cadence that announces a transferred line call. They have two choices as follows: Ring cadence one provides a 2 sec. on–4 sec. off tone. Ring cadence two provides a 0.5 sec.– 5.5sec. off tone. Ring cadence one is available to telephone users as a default and they can select the other one as they need it. Use this procedure to select the default cadence for each system station.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar to select cadence choice for default.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

7.2.35 Industry-Standard Telephone Support

The DXP digital communications system supports the use of industry-standard telephones. It does this through the use of DXIST-8 and DXIST-16 industry-standard telephone station interface circuit boards and a DXRNG ring generator assembly. Refer to the Comdial publication IMI89-078, *Installation Instructions DXP Digital Communications System Industry-Standard Telephone Support* for installation details. Program the DXP system to operate properly with industry-standard telephones by assigning values to DXP features using the procedures given below. They are presented in a typical order of progression but you can perform them in any convenient order.

IST Hold Confirmation

Description: Industry-standard telephones sound a special hold confirmation tone when their users place calls on hold. Prior to this software release, these telephones returned to intercom dial tone when their users placed calls on hold. The system defaults with the special confirmation tone enabled; however, you can disable the feature if you wish. The confirmation tone is three 80 ms. on –80 ms. off tone bursts repeated at 800 ms. intervals

Programming:

1. From main menu, select stations and press ENTER.
2. From stations menu, select station programming and press ENTER.
3. Type personal intercom number or previously assigned name for IST and press ENTER.
4. From the station programming menu, type item number for feature and press ENTER.
5. Press SPACE bar to enable or disable feature (yes = enable, no = disable) and press ENTER.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 3–7 for each station or press ESCAPE to end.

IST Ring Timeout

Description: Use this procedure to set the number of times that the system sends a ring signal to an industry-standard telephone on a system-wide basis. Although the ringing stops at the industry-standard telephone when the time-out occurs, the system continues to present the call at the telephone for answering until the caller abandons it.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

IST DTMF Receiver Timeout

Description: You can program the amount of time that the system waits to receive a DTMF tone from an industry-standard telephone, after the user has lifted the telephone's handset and before he or she has pressed a dial pad digit, on a system-wide basis. The system disconnects the telephone after this time-out occurs. If this happens, the user must hang up the handset and lift it again to re-establish the dial tone.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

IST Distinctive Ringing

Description: An industry-standard telephone can sound one ring cadence for intercom calls and a different ring cadence for outside calls or it can sound the same ring cadence for both types of calls. You must select one of these ringing styles on a station class of service basis. All industry-standard telephones with the same class of service have the same ringing style.

NOTE*: Do not enable distinctive ringing for voice mail ports.*

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service assigned to the IST and press ENTER.
5. From COS programming menu, type row number for IST distinctive ringing and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

IST Flash Time

Description: You can program, on a system-wide basis, the timed length of the signal that results when a user of an industry-standard telephone presses and releases the telephone hookswitch (or presses the TAP button if available on his or her telephone). Often, a signal with a short time length (typically 500–750 ms) serves to alert the system to receive a feature code (flash) while a signal with a long time length (typically 1.5–2.0 sec) serves to disconnect the line and re-establish dial tone (recall). The value that you set with this procedure is the maximum value for recognizing a flash from an industry-standard telephone. You can also set the minimum value for recognizing a flash from an industry-standard telephone.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for minimum flash time and press ENTER.
5. Press SPACE bar for minimum time and press ENTER to accept setting.
6. Press ENTER to select maximum flash time line item.
7. Press SPACE bar for maximum time and press ENTER to accept setting.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

IST Ringing Per Phase

Description: While the installer typically connects one industry-standard telephone per IST station port, he or she can connect two industry-standard telephones per IST station port; however, the telephones will share the same assigned intercom number. When he or she installs one telephone per port, you must set the IST ringing per phase feature to 16. When the installer places two telephones at any IST station port, you must change the IST ringing per phase feature to 8. A setting of 16 allows up to 48 industry-standard telephones per cabinet (main cabinet and expansion cabinet) to ring simultaneously. A setting of 8 reduces this simultaneous ringing total to 24 telephones per cabinet. This programming selection is on a system-wide basis.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters menu, and press ENTER.
4. From the system parameters menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ESCAPE once.
6. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

IST Ringing On Busy

Description: You can program industry-standard telephones to provide a ringing on busy signal to users. With this feature, when an IST telephone is busy on a call and another call comes to that telephone, the system sounds three quick tone bursts in the telephone's handset receiver. If a user does not wish to hear the ringing on busy tones while he or she is busy on a call, you can take this programming action to eliminate it.

Programming:
1. From main menu, select stations and press ENTER.
2. From stations menu, select station programming and press ENTER.
3. Type personal intercom number or previously assigned name for IST and press ENTER.
4. From the station programming menu, type item number for feature and press ENTER.
5. Press SPACE bar to enable or disable feature (yes = enable, no = disable) and press ENTER.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

Internal IST Flash

Description: If industry-standard telephone users access an outside line using the line group feature and then they quickly press and release (flash) the telephone's hookswitch, the IST will react in one of two different ways depending upon how you program this feature.

- □ **With this feature disabled**, IST users can flash the hookswitch while on an outside line and generate a hookflash signal on the outside line; however, they cannot flash the hookswitch to obtain an intercom dial tone. The previous *Section 7.2.35* procedure titled, *IST Flash Time*, sets the hookflash signal time. This time determines whether the IST hookflash signal is long enough to recall the outside line dial tone or short enough to access the outside line features. Refer to the CO specifications for actual requirements.
- □ **With this feature enabled**, IST users can flash the hookswitch while on an outside line and obtain intercom dial tone; however, they must dial ✻ 08 after they flash the hookswitch if they need to generate a hookflash signal on the outside line.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service assigned to the IST and press ENTER.
5. From COS programming menu, type row number for IST distinctive ringing and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

IST Ringing Patterns

Description: You can program the ringing pattern for either IST ring mode one or IST ring mode two. Mode one causes a two-second ring phase while mode two causes a shorter one second ring phase. For this feature to function properly, insure that the DXIST (industry-standard telephone interface board) contains firmware revision 2C or higher

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. Select IST ring mode from the system parameters and press ENTER.
5. Press SPACE bar to toggle between mode 1 (default) and mode 2.
6. When finished, press ENTER.
7. Press ESCAPE twice to end.

IST Ring Frequency

Description: The system will allow you to set a ring frequency of 25 Hz for international applications or set a ring frequency of 21 Hz for domestic applications. Choose a setting that matches the ring frequency of the installed ring generator.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. Select IST ring frequency from the system parameters and press ENTER.
5. Press SPACE bar to toggle between choices of 21 Hz and 25 Hz.
6. When finished, press ENTER.
7. Press ESCAPE twice to end.

7.2.36 Ring Back On Busy

Description: In systems operating with software releases prior to 8.B, when someone calls another telephone and the calling party is busy on an outside line, the caller hears a ring back tone—not a busy tone. When the caller is using a non-display telephone he or she has no means of knowing the busy status of the called party. (Remember, LCD speakerphones display called party status—for details on this feature, see Section 7.1.39, *Allow Busy Display*.)
With software release 8.B, you can take programming action that allows callers to hear a busy tone instead of a ring back tone when they call a party who is busy on an outside line.

Programming:
1. Press CONTROL T to return to the main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type the item number for feature and press ENTER.
6. Press SPACE BAR to choose setting(no = busy tone, yes = ring back tone) and press ENTER.
7. When finished press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

7.2.37 Line Out Softkey Option

Description: Beginning with software release 9A, you can select between two different interactive button menu options that LCD speakerphones display when connected to outbound lines for outgoing calls. Specifically, this action substitutes a release (RLSE) button for the automatic redial (ARDL) button. This feature enhances DXP installations within the international community because some nations have specifications in place that disallow automatic redialing.

Programming:
1. Press CONTROL T to return to the main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type the item number for line out softkey option and press ENTER.
6. Press SPACE BAR to choose setting(CONF SAVE ARDL or CONF SAVE RLSE) and press ENTER.
7. When finished press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

7.3 Square/Non-Square System (Button Mapping By Station)

Description: The system assigns certain functions to each of the station buttons as a default condition. Re-assign the button functions with this programming feature. You can assign functions at a first level or at a second level at each button. Assign functions at the first level that require status light feedback because the system does not provide status light feedback to buttons at the second level (press CONTROL N to display the second level).
You can also use this procedure to map the buttons on a DSS/BLF console (press CONTROL N to display the console buttons) but first you must use the Section 7.2.26, *Console Installed*, procedure to assign the console to the station and name the console port.

Programming: To map the telephone buttons,

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select button mapping and press ENTER.
4. Type prime intercom number or previously assigned name and press ENTER. (Screen presents current button map for review.)
5. Type first level button code (L1–L25, 0–9) and press ENTER.
6. Type mnemonic of feature from list (below) and press ENTER. (Press and hold SHIFT and type ? for mnemonic definitions—press any key to return to button map.)

NOTE: If you press ENTER without first typing a mnemonic, the system “blanks” that button. Users can program “blanked” buttons as personal speed dial buttons.

7. Repeat steps 5 and 6 for all desired buttons.
8. Press CONTROL N and repeat steps 5 and 6 for second level (or DSS/BLF console).
9. Press ESCAPE and repeat steps 4–8 for each station.
10. When finished, press ESCAPE twice.

To map dial pad buttons with speed dial numbers,

1. Repeat steps 1 through 4 from the previous procedure.
2. Type dial pad button number (1–0) and press ENTER.
3. Type i for intercom, l for line, g for line group, or p for prime line or last line used, or a for automatic route selection and press ENTER.
4. Type 1–128 to choose line or type 1–16 to choose line group and press ENTER.
5. Type speed dial number (up to 16 digits) and press ENTER.
6. Repeat steps 1–4 for all desired dial pad buttons and then repeat steps 7–9 from the previous procedure.

7.3.1 Feature Mnemonic List

ACCT (account code button): allows users to enter an account code
ALTRN (alternate attendant button): places station in alternate attendant mode
ANSWER (answer button): answers a ringing call
APAGE (auxiliary page button): allows auxiliary page operation (model 8024S and 7700S–rev I and later)
ARD (automatic redial button): redials last dialed number 10 times with one minute off time
ARECD (auxiliary record button): allows auxiliary record operation (model 8024S and 7700S–rev I and later)
ARING (auxiliary ring button): allows auxiliary ring operation (model 8024S and 7700S–rev I and later)
AUTH (authorization code button): prompts for authorization code entry
BOTH (both button): conferences current party with last party placed on hold
CAMP (camp on button): engages camp on feature at busy station or line
CID (caller ID button): sends caller ID RNA records to LCD
DND (do not disturb button): enables/disables do not disturb mode
DPKUP (directed call pick up button): picks up call ringing at another station
DSTAT (DSS status button): selects station DSS status view (line and intercom or just intercom)
EXOVR (executive override button): allows executive override of another station
FEATR (feature button): use with feature code to access certain features
FWD-A (forward all button): enable/disable all call forwarding
FWD-P (forward personal button): enable/disable prime line and personal intercom call forwarding
FWDRA (forward all RNA button): enable/disable all call after RNA forwarding
FWDRP (forward personal RNA button): enable/disable prime line and personal intercom calls after RNA forwarding
GPLSN (group listen button): allows group listen operation (digital multiline telephones)
GPKUP (group pick up button): picks up a call that rings anywhere within a group of stations
HDST (headset button): enables/disables headset mode
HOLD (hold button): places current call on hold and scrolls list of held calls
ITCM (intercom button): accesses personal intercom number
I#### (intercom number button): group intercom number or station DSS
LCDMS (LCD messaging button): enables/disables LCD message feature
LNG## (line group button 1–16): accesses one of 16 line groups
LN### (line button 1–128): accesses one of 128 lines
LOCK (lock button): prevents/allows station use (prevents station use until someone dials an authorization code)
MMEPG (meet me page button): answers a page by meeting intercom paging party on line
MSGWT (message waiting button): turns on/turns off message waiting light at another station
MUSC# (music source button 1, 2): turns on/turns off background music
NIGHT (night mode button): allows attendant to place system in night transfer (of ringing) mode
OAI## (open architecture button): special Enterprise functions (used with Total Control PC Attendant and Enterprise Toolkit options)
OVERFL (overflow button): turns on/turns off overflow mode
PAGE# (paging zone button 1–8): allows group paging
PARK# (park orbit button 1–9): parks and retrieves calls
PRVCY (privacy button): releases privacy on line so another station can join a call
QUEUE (queue button): queues station at busy line group to await idle line
RLSE (release button): disconnects current call
RSP## (response button 1–30, S = universal): sends response message to another station for SOHVA and message deposit
S-OBS (service observe button): enables station to service observe another station
SAVE (dynamic save button): saves last dialed number and line on which it was dialed
SDIAL (speed dial): saves often dialed number at a button
SILNT (silent ringer button): mutes ringing for current call
SOHVA (SOHVA button): sends SOHVA to another station
SPLIT (split button): allows station user to talk to two different parties
SRIAL (serial call button): transfers a serial call to specified stations
SYSST (system status report button): indicates system status report
TAFS# (night answer button 1–4, S= all calls): answers call indicated by system's ringing relay
TBUSY (line test busy button): views status of busy line
TRACK (Tracker pager activate button): sends message to pager display
VABLK (voice announce block button): blocks/allows voice announcements
VOLSV (save volume button): saves volume settings (digital multiline telephones)
XVM## (transfer to voice mail button 1–32): transfers call to voice mail box when used with DSS button

NOTE: Many of the feature buttons require programming action before they can function as described.

7.4 Telephone Types (Phone Types)

Description: This programming feature allows you to identify the particular type of system telephone equipment that you or your installer will connect to each station port.
You can also mark the station port equipment as undefined so that the system will not test the port for a specific type of equipment and will not include the port in any menu presentations. Also refer to Section 7.2.25, *Disabled,* for the procedure for disabling a station port.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. From station programming menu, select phone types and press ENTER.
5. From the phone types menu, select desired equipment or none (for undefined) and press ENTER.

NOTE*: Depending upon which equipment you choose, the system will present different sub-menus that allow you to further define the equipment as to the quantity of lines it can serve, whether it is a speakerphone, whether it is a DSS/BLF console, and other defining characteristics. Follow the sub-menu prompts and press ENTER after you have typed each selection.*

6. Type the station port number (1–192) and press ENTER.
7. Press ESCAPE to end.

ExecuTech Telephone Types

DXP Menu List	Product Code
23 Line	6620, 6620E, 6620S, 6620T,
22 Line	6614, 6614E, 6614S, 6614T
17 Line	6600E, 6600S
Proprietary Single Line	6701X
32-Button Console	DB32S
70-Button Console	DB70
ATI-X	ATI-X
OPX-X	OPX-X
VMI-X	VMI-X

ExecuTech 67xx Telephone Types

DXP Menu List	Product Code
14 Line	6714S, 6714X
12 Line	6700S
6 Line	6706X
2 Line	6702X
SLPS w/ Autodials	6709A*
32-Button Console	EB32X

Americom Telephone Types

DXP Menu List	Product Code
19 Line	7016S, 7116S, 7116X
10 Line	7010S, 7110S, 7110X
2 Line	7102X
Single Line	6701X
32-Button Console	not currently available
64-Button Console	XD64X
ATI-D-1PT	ATI-D-1PT

Comdial Express Telephone Types

DXP Menu List	Product Code
19 Line	6116X, 6116S, 6016S
10 Line	6110X, 6110S, 6010S
2 Line	6102X
Proprietary Single Line	6701X
32-Button Console	XB32X
64-Button Console	XB64X
ATI-X	ATI-X
OPX-X	OPX-X
VMI-X	VMI-X

DigiTech Telephone Types

DXP Menu List	Product Code
24 Line	7700S, 7714S, 7714X Rev H and later
22 Line	7714X, 7714S Rev H and earlier
17 Line	7700S
Single Line	7701X
32-Button Console	DD32X

Impact Telephone Types

DXP Menu List	Product Code
24 Line	8024S, 8124S
12 Line	8012S, 8112S, 8112N
Single Line	8101N
64-Button Console	IB64X

Wireless Telephone Type

DXP Menu List	Product Code
Wireless	900MX

* Use the Section 7.3, *Square/Nonsquare System*, procedure to "blank" the 12 speed dial buttons on this telephone so that users can custom program them for personal use.

7.5 Copy Model COS, Station, Button Map (Block Programming)

7.5.1 Block Programming, Class-Of-Service

Description: Program some or all class-of-service categories to match the programming of a model class-of-service category.

Programming;
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the station menu, type item number for feature and press ENTER.
4. Select model COS by typing COS number 1-32 for source COS and press ENTER.
5. Type COS numbers of destination COS(s) (n,nn or n–nn) and press ENTER.
   Values of source COS is assigned to destination COS(s), and programming is ended.

7.5.2 Block Programming, Station Features

Description: Program some or all stations to have the same features as a model station. The system does not copy the following features from the model station:
- station name,
- intercom numbers,
- personal speed dial numbers,
- DSS/BLF console installed,
- console port,
- alternate attendant,
- overflow attendant,
- interactive button support.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the station menu, select model station and press ENTER.
4. Type personal intercom number or previously assigned name of source station and press ENTER.
5. Type personal intercom numbers or previously assigned names of destination stations (nnn,nnn or nnn–nnn) and press ENTER. Values of source station is assigned to destination stations, and programming is ended.

7.5.3 Block Programming, Button Mapping

Description: Program some or all stations to have the same button features as a model station.

Programming;
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From stations menu, type item number for feature and press ENTER.
4. Type personal intercom number or previously assigned name of source station and press ENTER.
5. Type personal intercom numbers or previously assigned names of destination stations (nnn,nnn,or nnn–nnn) and press ENTER.
   Button map of source station is assigned to buttons of destination stations, and programming is ended.

8 Programming Line Features

- Line Programming 8.1
- Line Group Programming 8.2
- Copy Model Line (Block Programming, Line) 8.3
- Direct Inward Dialing (DID) Support 8.4
- Ground Start Line Support 8.5
- Loop Start Line Support 8.6
- Tie Line Support 8.7
- Direct Inward System Access Programming 8.8
- Programming The T1 Parameters 8.9

8.1 Line Programming

8.1.1 Line Name

Description: You can assign a name to a line. A name shows in the display of an LCD speakerphone as a identification aid. A valid name is composed of any seven alpha-numeric characters but the first character must be an alphabetic character.

Programming: To assign a name to a line,

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number 1–128 number or previously assigned name and press ENTER.
5. From line programming menu, type item number for feature and press ENTER.
6. Type name (a–z, A–Z, 0–9) and press ENTER. A name can be up to seven characters long.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.2 Line Type

Description: Condition the line port as to the type of line or function that the port serves.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number 1–128 or previously assigned name and press ENTER.
5. From the line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting and press ENTER to accept setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

Ground Start Line

Refer to Section 8.5, *Ground Start Line Support*, for a discussion about ground start lines.

Loop Start Line

Refer to Section 8.6, *Loop Start Line Support*, for a discussion about loop start lines.

E&M Tie Line

Refer to Section 8.7, *Tie Line Support*, for a discussion about E&M tie lines.

DID Line

Refer to Section 8.8, *Direct Inward System Access (DISA) Programming* for a discussion about DID lines.

Auxiliary Port

If you type-name a line port as an auxiliary port, you condition the line port to interface with external paging equipment instead of a telephone line.

E&M DNIS Line

Description: Dialed Number Identification Service (DNIS) is a T1 service feature for E&M lines. Long distance carriers offer DNIS as a feature to dial 800 and dial 900 lines. DNIS identifies the numbers that callers dial to reach an internal telephone system. Businesses served by a dial 800 or dial 900 service allow calls to ring on any available line within an assigned block of lines and then have their internal telephone system process the DNIS information to route the calls to their proper destinations.

The common carrier supplies DNIS information as DTMF digits. When the DNIS feature is combined with the Automatic Number identification (ANI) feature, the common carrier delimits the ANI information from the DNIS routing information with the asterisk (✳) tone so that the DXP system can process each portion properly.

The DXP uses information that you program in the DID/DNIS translation table to route the call to the proper intercom number. The system also sends the called number information to the SMDR/SMDA line report and makes the information available to devices that are connected to the DXP's Open Architecture Interface (OAI).

As a single service, if the call routes to an LCD speakerphone, the speakerphone's display shows the name that you programmed in the DID/DNIS translation table. If you have programmed no name there, the display shows the DNIS/DID block name that you assigned to the DID/DNIS block. If you have programmed no name there, the display shows the processed DNIS digits. (As a DNIS/ANI combined service, the display shows the processed ANI digits.)

E&M DNIS lines access the Direct Inward System (DISA) feature when the DNIS digits translate into the DISA access code.

Since the DXP system supports the DNIS only on tone dial lines, it supports both wink start and delay start protocols but does not support the immediate start protocol.

Programming: Program the line type to be E&M DINS using the Section 8.1.2, *Line Type*, procedure.
Program the E&M DNIS tie line attributes using the Section 8.4.3, *DID/DNIS Programming*, procedure.
Program the DID/DNIS translation table using the Section 8.4.4, *DID/DNIS Translation Table*, procedure.

8.1.3 Line Disable

Description: Take a line port out of service because of defect or other reason using this programming choice.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From line menu, select line programming and press ENTER.
4. Type line port 1–128 or previously assigned name and press ENTER.
5. From line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.4 Music Or Tone On Hold

Description: With this feature enabled, the system will supply music, tone bursts or other audio information to callers while they are on hold. The music or information source is external to the common equipment and is customer supplied. The system will accept two music sources. You can use one source for this feature and the other source for the background music feature discussed in Section 7.1.3, *Background Music*. When the system supplies tone bursts to callers while they are on hold, it sounds two .1 second long tone bursts separated by a .1 second interval of silence. It repeats this tone burst sequence every 5 seconds.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. From line programming menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 4–7 for each line or press ESCAPE to end.

8.1.5 Ringback On Transfer

Description: Beginning with software release 8C, installers have the ability to control what outside parties hear while the system transfers their calls to an internal extension. Prior to this software release, outside parties hear whatever the music on hold source provides. With software release 8C, programmers can select ringback tone in place of music on hold on a per line basis.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From line programming menu, type item number for ringback on transfer and press ENTER.
6. Press SPACE bar for feature setting and press ENTER
7. Type y to accept changes, n to reject them, or r to resume editing and press ENT**ER.**
8. Repeat steps 4–7 for each line or press ESCAPE to end.

8.1.6 Automatic Privacy (Privacy Release)

Description: Assign privacy release to a line so that a user can press the privacy button on his or her telephone and change a private line into a non-private one as needed. When a line is private, a station user has exclusive use of it during a call. Also refer to the Section 7.3, *Square/Nonsquare System—Button Mapping By Station*, procedure to map a privacy button on the user's telephone.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming.
4. Type line port number (1−128) or name and press ENTER.
5. From the line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for desired feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.7 SMDR Record

Description: When you enable this feature, the system stores SMDR records for the specified line. Refer to Section 10, *SMDA/SMDR Programming*, for other SMDA/SMDR programming considerations.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From line programming, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.8 Cost Incoming

Description: If you have arranged for the system to cost calls, you can arrange for it to also cost incoming calls on a per line basis. You can arrange for the costing to begin as soon as the call arrives in the system , begin after the user answers the call or begin after a programmed delay. Plus, you can pick the call rate table that you want the system use when it costs the call. Refer to Section 12, *Enabling Automatic Route Selection*, for other automatic route selection programming considerations.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming.
4. Type line port number (1–128) or name and press ENTER.
5. From the line programming menu, type item number for feature and press ENTER.
6. From cost incoming prompt, press SPACE bar for desired feature setting and press RETURN.
7. From incoming cost delay prompt, press SPACE bar for desired feature setting and press ENTER.
8. From incoming cost route prompt, type 1–32 for desired rate table.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.9 Pad Level—Transmit, Receive
(Gain And Attenuation Settings For Line Transmit And Receive)

Description: This feature enhances the DXPT1 digital carrier transmission option, the pad level programming feature adjusts voice levels for both the transmit and receive circuits in the individual channels.
The choices include: Gain 2, Gain 1, Nominal, Loss 1, Loss 2, Loss 3, Loss 4, and Loss 5. These settings provide an approximate +6 to -15 dB range of choices. Starting at the Nominal setting, each gain level represents an approximate 3 dB amplification of the signal level from the previous setting, and each loss level represents an approximate 3 dB attenuation of the signal level from the previous setting. Because digital transmission does not lose volume level as readily as analog transmission does, it is likely that the receive level may be noticeably higher when using the T1 option. Therefore, you may need to select a low setting such as Loss 2 for the voice level receive parameter when programming this feature for T1 lines that are being used exclusively for voice transmission. Further, if you choose a setting to increase the receive gain, you should carefully examine speakerphone operation. It is possible to select a receive gain that will, under certain conditions, interfere with proper speakerphone operation.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From line programming menu, type item number for pad level—transmit and press ENTER.
6. Press SPACE bar for feature setting and press ENTER for pad level—receive.
7. Press SPACE bar for feature setting.
8. Press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 3–9 for each line or press ESCAPE to end.

8.1.10 Pad Level—DISA
(Gain Setting For DISA Lines)

Description: Callers that use the DISA feature to access a trunk group and place calls (trunk–to–trunk calling) may experience low audio levels on their calls due to the normal line resistance of CO lines. While low audio level is usually only noticeable on long line loops. Software 8C adds +3dB of gain to the DISA lines as a default setting, and provides a means for you to disable this gain if necessary.

The software enhancement also provides a means by which DISA callers can preselect the gain on a DISA line before they select the line for use. They can dial a code to select either 0dB, +3dB, or +6dB of gain.

NOTE: The unamplified line-to-line DISA connections often exhibit low audio levels due to double loop copper losses. While adding gain to these connections will sometimes improve audio signal levels, the added gain may also result in circuit instability in some connections. This instability presents itself as a singing sound that can interfere with dialing or voice communications. If callers experience dialing problems or hear singing in their calls, you may need to disable the pad level for the DISA line or they may need to select a lower gain setting for use.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From line programming menu, type item number for pad level—DISA and press ENTER.
6. Press SPACE bar for feature setting and press ENTER
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

9. Repeat steps 4–7 for each line or press ESCAPE to end.

8.1.11 Dialing Mode

Description: Program the line port to match either a DTMF tone or a rotary (pulse) dialing line as supplied by the central office (CO).

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number (1−128) or name and press ENTER.
5. From line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting and press ENTER to accept setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

Pulse Dial Make/Pulse Dial Break (Pulse Dial Ratio)

Description: Use this procedure to set the make/break ratio for rotary dial signalling to match rotary dial line requirements. You can set the line make/break ratio for rotary dial (pulse dial) signalling in a more flexible manner to match many different rotary dial line requirements. You can set the make time and the break time independently in one msec. increments to any time from one to 99 msec.

Programming:
1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER,
4. From timing menu, type item number for line pulse make and press ENTER.
5. Type desired time (1–99) and press ENTER,
6. From timing menu, type item number for line pulse break and press ENTER.
7. Type desired time (1–99) and press ENTER.
8. Press ESCAPE twice,
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Pulse Dial Interdigit Time

Description: You can set the interdigit time between dial pulses when the system pulse-dials a number over a line. The DXP defaults this time to 200 msec. and provides a range of timing values between 100 msec. and one sec. that you can set in 100 msec. increments.

Programming:
1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER.
4. From timing menu type item number for feature and press ENTER.
5. Press SPACE bar to select desired time and press ENTER to select setting.
6. Press ESCAPE twice,
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

8.1.12 Abandon Hold Release

Description: When a distant party abandons a hold condition and his or her station disconnects from the line, the central office sends a forward disconnect signal to the system. This signal is either 50 or 350 msec. in length. Use this procedure to program the line port to match the central office signal length.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From line programming menu, type item number for feature and press ENTER for feature.
6. Press SPACE bar for feature setting and press ENTER to accept setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.13 Positive Disconnect Time

Description: When a station drops a line after its user has finished using it, the system waits a programmable length of time before it allows another station to access that line. This time delay helps prevent such conditions as call-collision. The system holds the line status light on during the time out period.

Programming

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number 1–128 or previously assigned name and press ENTER.
5. From line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting and press ENTER to accept setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.14 Toll Groups

Description: You must identify the individual lines that you do not want users to use when they dial toll restricted numbers. Do this by first assigning the lines to toll groups and then assigning those toll groups to the restricted number. There are 32 toll groups available for line assignment. Assign one, several, or all lines to any desired toll group or combination of toll groups as needed. See Section 11, *Programming Toll Restriction,* for complete toll restriction programming details.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line name or line number and press ENTER.
5. From line programming, type item number for toll group and press ENTER.
6. Type line number (1–128) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end..

8.1.15 DTMF Level

Description: Adjust the audio level of the DTMF signals to a low (-5 db), medium (0 db), or high (+3 db) setting. Certain sites may require a higher db level to over come line conditions that could interfere with reliable dialing such as a long loop distance to the central office.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select line and press ENTER.
3. From line menu, select line programming and press ENTER.
4. From line programming menu, type item number to select feature and press ENTER.
5. Press SPACE bar for desired setting and press ENTER.
6 When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 4–7 for each line or press ESCAPE to end.

8.1.16 Busy Lead Detection *(Auxiliary Equipment Interface)*

Description: When you enable this feature, the system can detect an off-hook condition in a telephony device such as a modem, FAX machine, industry-standard telephone, or similar device that an installer has connected to a line ahead of the system. When the system detects the off-hook condition, it makes a busy indication appear at system stations that have this line appearance.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From the line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.17 Disconnect Supervision

Description: When you enable this feature, the system detects a break in loop current anytime one occurs during an outside call.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

8.1.18 Caller ID Active

Description: When caller identification (ID) information is available from the central office, take this programming action to match the line port to the feature. You must also assign the caller ID lines to the stations and assign special-purpose station buttons to control the feature. Refer to Section 14.1, *Caller ID Programming,* for complete caller ID programming details.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From the line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4 through 8 for each line port or press ESCAPE to end.
10. Assign caller ID lines to stations—refer to Sections 7.1.32, *Line Answer,* and 7.1.33, *Line Originate,* for details.
11. Assign caller ID button (mnemonic CID) and SAVE button (mnemonic SAVE) to stations (refer to Section 7.3, S*quare/Nonsquare System—Button Mapping By Station*, for details).

8.1.19 Voice Mail ID

Description: You can assign an identification number to each line so that the voice mail system can provide customized call handling on a per line basis. Use voice mail system programming to match this ID number to a particular personal directory or transaction box within the voice mail system. When the DXP routes a call that is ringing at a particular line to the voice mail system to be answered, it routes it with the ID number. The voice mail system then sends the call to the box that corresponds to the line's ID number. You can use voice mail system programming to construct customized answering prompts for the individual boxes. This allows the IDed DXP lines to be answered in a customized manner by the voice mail system's automatic attendant. Refer to Section 14.5, *Voice Mail Programming*, for complete voice mail programming details.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select line and press ENTER.
3. Type port number of line to be programmed (1–128) and press ENTER.
4. From the line menu, select item number for feature and press ENTER.
5. Type the identification (ID) number and press ENTER.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 3–7 for each line or press ESCAPE to end.

8.1.20 DISA And DISA Voice Options

Description: Use the following programming instructions to enable or disable DISA capability on lines 1 through 240. Also, use the DISA Voice Options 1 through 4 to select digital voice announce (DVA) messages. For example, selecting DISA voice option 2 will cause welcome greeting 2, day main menu 2, night main menu 2, recall no answer 2, and recall busy 2 prompts to play whenever a DISA line is covered by DVA. Refer to Section 14.3, *Digital Voice Announce Programming*, for complete DVA programming details.

Programming

1. Press CONTROL T for main menu.
2. From main menu, select Lines and press ENTER.
3. From the lines menu, select Line Programming and press ENTER.
4. Enter line number you want to program and press ENTER.
5. From the line (number) programming menu (page 2), select DISA and press ENTER.
6. Toggle the SPACE bar to select/deselect DISA and press ENTER.
7. Enter 1 through 4 for the DISA Voice Options and press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Enter the number for the next line you want to program or press ESCAPE to end.

8.2 Line Group Programming

Description: Use this procedure to group similar type line ports together for dial-up access. Up to 16 different line groups are available. During operation, the system searches for an idle line in the line group in the same order that you program them using this procedure.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line group programming and press ENTER.
4. Type line group number (1–16) and press ENTER.
5. From line group programming menu, type a to add lines, r to remove lines, or c to change name of line group and press ENTER.
6. Type line to be removed, added or changed, then press ENTER.
7. When finished, press ESCAPE.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–7 for each line port or press ESCAPE to end.

8.2.1 Line Group Access

Description: Use this procedure to give a station access to line groups.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Type line groups (1–16, 0 = none, type as n,n,nn or n–nn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

8.2.2 Line Group Queuing

Description: Use this procedure to give a station the ability to queue for a busy line group.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select COS programming and press ENTER.
4. From the COS programming menu, type item number for feature and press ENTER.
5. When finished, press ESCAPE twice.
6. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
7. Repeat steps 4-8 for each COS or press ESCAPE to end.

8.3 Copy Model Line *(Block Programming, Line)*

Description: Program some or all line ports to have the same programming as a model line port.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select model line and press ENTER.
4. Type line port number (1-128) or name of model line to be copied and press ENTER.
5. Type line port numbers of lines to match model and press ENTER. (Type line port numbers as n,n,nn or n–nn.)
6. Press ESCAPE to end.

8.4 Direct Inward Dialing (DID) Support

The DID line board (DXPCO-DD4 and DD8) allows incoming CO calls to reach internal DXP intercom extensions by direct dialing. No attendant assistance is necessary. Since DID lines are incoming only, their direct appearance is limited to attendant stations where status indication may be useful. DID operation requires a group of published directory numbers (400 maximum) provided by the telephone company central office (CO). These directory numbers are incoming only and the DXP translates them to the appropriate personal or group intercom number for ringing. The lines will accept outgoing DTMF digits during a call to support personal identification number dialing and similar uses.

The DXP handles DID calls in the same manner that it handles regular intercom calls and will forward them via a hunt list or a call forwarding scheme. An unanswered DID call will either continue to ring or route to a programmed ring no-answer (RNA) destination. If neither forwarding nor RNA is available, the system provides no routing.

The system returns a ringback signal to DID callers when a called station is in the do not disturb (DND) mode.

The system returns an off-hook indication to the CO when a DID line is disabled. The DXP synchronized ringing feature does not have any affect on DID calls, and the Caller ID feature is not available.

The DID line is a reverse-battery, loop-start, two-wire voice circuit. (The term reverse battery means that it is the DXP and not the CO that provides tip and ring supervisory battery for the loop.) The DXP sends and receives all supervisory and voice signals across the voice pair and provides all necessary signal control at its line interface.

In the idle state, the loop is open at the CO end, with the DXP maintaining on-hook battery polarity on the circuit.

The CO requests service from the DXP by applying a resistance across the line causing a current flow to occur.

The DXP recognizes the current flow as a CO connection and prepares for the incoming call. The CO does not send ringing since the DXP generates it internally and sends it to the stations.

After the DXP receives all of the address digits, it translates them based on the appropriate DID block translation table and attempts to place the call to the desired station. To assure that the caller will always hear ringback prior to the call being answered (for example, when answered by voice mail), the system delays the station ringing until it applies ringback tone.

The called station sounds a distinctive ringing based on the ring code in the translation table. If the translation table has a name for the CO digit sequence that the DID call is on, the LCD of the called station displays that name. Otherwise, the station displays the DID block name followed by a portion of the CO digit string. If there is neither CO digit string name nor DID block name programmed, the station displays the CO digit string alone.

If an incoming call is for either an unassigned or an uninstalled station, the DXP routes the call to the DID block alternate extension. If the DID Block alternate extension is unavailable, the DXP routes the call to the Dial 0 attendant. If the Dial 0 attendant is unavailable, the DXP returns reorder tone to the caller.

The DXP returns call progress signals to the CO in the interval after it receives address signalling and before it answers. It does this within 1.5 seconds after completion of address signalling.

When a called station answers a DID call, the DXP sends answer supervision to the CO by applying reverse polarity to the line. The DXP maintains this polarity reversal until either the station goes on-hook or the CO opens the loop.

The CO signals a line disconnect condition to the DXP by opening the loop. When the DXP detects the CO disconnect, it returns the line to idle polarity and changes the line from busy to idle. The DXP signals a line disconnect condition to the CO by returning the supervision battery polarity to the on-hook state. While immediate start lines return to idle at once, wink and dela tart lines maintain busy status until the DXP detects CO release.

8.4.1 Direct Inward Dialing Line Examples

Example 1:
Jenny's Bakery has the following CO numbering blocks:
555-3600 to 555-3619,
555-4520 to 555-4539,
555-1200 to 555-1399.
It will receive the 36nn and 45nn calls through CO lines 1–5 and the 1nnn calls through CO lines 6–8. The system requires two DID blocks for use: block one for CO lines 1–5, and block two for CO lines 6–8. The numbers in DID block one have two unique digits and the numbers in DID block two have three unique digits. Assume that DID block one is configured as wink start, tone dial, has a 2-digit string, and is named SALES. Assume DID block two is configured as delay start, tone dial, has a 3-digit string, and is named SERVICE.

Example 2:
Ed's Telephone Mart starts with 20 CO numbers 555–2320 to 555–2339. Only one DID block is used and is configured as wink start, pulse dial, with a 2-digit string. As the company grows, they add another 20 CO numbers 555–3420 to 555–3439. You cannot simply add these numbers to the existing DID block translation table. This is because a 2-digit string will not uniquely specify which number was dialed. You must either treat these two CO blocks as two different DID blocks or increase the expected digit string quantity to three.

CAUTION

Increasing the expected digits for a DID translation block deletes all entries in that block, and you must reprogram the table.

8.4.2 DID Options

DID/DNIS Block Name

Description: Choose a 7-character name to associate with each DID/DNIS block.

Programming: Refer to Section 8.4.3, *DID/DNIS Programming*.

DID Control Signalling

Description: Decide upon which address supervision signalling protocol that you will use. This decision will depend upon the type of supervision that is compatible with the CO requirements.

Immediate Start: Use this protocol for rotary (pulse dial) lines. With this protocol, the CO will not expect address supervision signalling and may begin pulsing the dialing digits as soon as 65 msec. after it connects to the line.

Wink Start: With this protocol, the CO will expect address supervision signalling. After the CO connects to the line, the DXP will reverse the polarity of the line for a period of 200 msec when it is ready to receive digits (that is, the DTMF receiver is available for tone dial lines). This "wink" signal indicates to the CO that the DXP is ready to receive incoming digits. After the wink occurs and the line polarity returns to normal, the CO will begin sending the dialing digits. If the CO does not see the wink within 4 to 8 seconds (heavy traffic timings), it may route the call to network reorder or retry the call on another line. Typically, a CO will try to dial two times. A second failure will result in network reorder. Wink start protocol is the best choice for its combination of integrity checks and retrial capabilities.

Delay Start: With this protocol, the CO will expect address supervision signalling. Approximately 100 msec. after the CO connects to the line, the DXP will reverse the polarity of the line for a period of at least 140 msec. It will hold this reversal until it is ready to receive incoming digits. At that time, it will return the polarity to normal. After the line polarity returns to normal, the CO will begin sending the dialing digits. If the CO does not see the line polarity return to normal within 4 to 8 seconds, it will route the call to network reorder. There is no requirement for the CO to retry failures on lines with delay dial signalling.

Programming: Refer to Section 8.4.3, *DID/DNIS Programming*.

Expected CO Digits

Description: Obtain a block of numbers for use from the CO. The DXP supports a maximum of 400 numbers (for example, 555–1000 through 555–1399). You can have a maximum of four DID blocks with each DID block using its own name, signalling protocol, digit addressing method and number of digits needed to avoid numbering conflicts. As a default, the system assigns all DID lines to block one. A DID block represents a group of lines that the system will use to receive calls for one or more CO directory number blocks.

NOTE: You will derive maximum user convenience if you choose the CO block to match the intercom numbers that you have assigned to the DXP system. (For example, if your intercom numbers are 1000–1399, they would match the sample CO block.)

Determine the quantity of unique digits in the string that you expect to receive from the CO. The number of digits expected should be large enough to avoid numbering conflicts within a DID block and provide future growth. In the case of the CO block mentioned above, the quantity of unique digits is three to cover 1000 through 1399. If the CO block was 555–1100 through 555–1192, the string quantity would be two to cover 00 through 192.

Programming: Refer to Section 8.4.3, *DID/DNIS Programming.*

Dialing Mode

Description: Based upon the system's expected incoming call volume and recommendations and requirements of the CO, determine whether the CO will send address digits by DTMF tones or by loop pulse (rotary) dialing. (Always choose DTMF tones if possible.)

Programming: Refer to Section 8.4.3, *DID/DNIS Programming.*

ANI Delivery

Description: Enable or disable the DXP to process ANI information that is delivered by the long distance common carrier as a T1 feature on dial 800 and dial 900 lines. Refer to Section 8.7.4 for details about the ANI feature.

Programming: Refer to Section 8.4.3, *DID/DNIS Programming.*

DISA Voice Options

Description: Use the DISA Voice Options 1 through 4 to select digital voice announce (DVA) message levels. For example, selecting DISA voice option 2 will cause welcome greeting 2, day main menu 2, night main menu 2, recall no answer 2, and recall busy 2 prompts to play whenever a DISA-configured DID line is covered by DVA. Refer to Section 16, *Digital Voice Announce Programming*, for complete DVA programming details.

Programming: Refer to Section 8.4.3, *DID/DNIS Programming.*

DID Alternate Routing

Description: Use this procedure to select an attendant station to serve as an alternate routing station. The system will route DID calls to this station if it cannot find the digits it receives from the CO in the translation table. The system will ring this station with a distinctive ring tone or pattern that you program. If you do not select an attendant station with this procedure, the system routes the call to the dial 0 station. If the dial 0 station is not available, the system returns a reorder tone to the caller.

Programming: Refer to Section 8.4.3, *DID/DNIS Programming.*

8.4.3 DID/DNIS Programming

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, type the selection for lines and press ENTER.
3. From the lines menu, type the selection for DID/DNIS block programming and press ENTER.
4. From the DID/DNIS block prompt line, type the DID/DNIS block number and press ENTER.
5. From the DID/DNIS block programming menu, select options, and press ENTER
6. From the options menu, set the parameters for the DID/DNIS block that you are programming:

Name	Type up to seven characters and press ENTER.

NOTE: End the DID/DNIS block name with a space if you desire a blank space between the name and the CO digits when they show on an LCD speakerphone's display. Also, the number of CO digits that will show in the display is dependent on the length of the DID/DNIS block name.

Control Signalling	Press SPACE bar for protocol choice and press ENTER.
Expected Digits	Type quantity (0–7) of digits and press ENTER.
Dialing Mode	Press SPACE bar for choice and press ENTER.
ANI Delivery	Press SPACE bar for Yes or No and press ENTER.
DISA Voice Options	Type DVA message identification number (1–4) and press ENTER.
Alternate Routing	Type intercom number (up to four digits) for station to handle misdialed calls.
Ring Code	Type code (1–8) to specify the ringing pattern for calls to the alternate station.

7. When finished, press ESCAPE.
8. Type y to accept changes, n to reject them, or r to resume editing then press ENTER to return to the DID/DNIS block programming menu.

NOTE: If you save the changes and you have changed the expected digits value, additional prompts may appear.

8.4.4 DID/DNIS Translation Tables

Description: When you initialize a translation table, you must first enter the string of CO digits that you obtain from the telephone company. Then you must enter the intercom number that you want to match with the first CO digit sequence in the string. With this, the system automatically matches the remainder of the CO digit string to consecutive intercom numbers beginning with the one that you entered. You can edit the translation table by selecting the item number for each entry and making the changes that you deem necessary. The translation table includes the following listed items:

CO Digit String: This is the actual string of digits expected from the CO. Within a table, each CO digit sequence in the string must be unique. While each CO digit sequence must have an assigned extension number, you can assign the same extension number to several CO digit sequences if you wish.

Name: As an option, you can enter a seven character name for each CO digit sequence in the string. If you assign a name, the system will use it for LCD display during signalling.

Day Number: This personal or group intercom number is the one that the system will ring when a DID/DNIS call arrives through the matching CO digit sequence during normal or daytime operations. DID/DNIS will not support Delay Ring, Day 1 ring, or Day 2 ring modes.

Night Number: As an option, you can assign a personal or group intercom number that the system can ring when a DID/DNIS call arrives through the matching CO digit sequence during night transfer (of ringing) operations.

Ring Code: As an option you can choose one of eight distinctive ringing codes for each CO digit sequence in the string. Remember, the proprietary analog telephones provide only four distinctive ring possibilities.

DID Translation Tables Programming

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, type the selection for lines and press ENTER.
3. From the lines menu, type the selection for DID/DNIS block programming and press ENTER.
4. From the DID/DNIS block prompt line, type the DID block number and press ENTER.
5. From the DID/DNIS block programming menu, select initialize translation table, and press ENTER.

NOTE: If you choose the initialize translation table entry, the system will prompt you to enter a range of CO digit strings (system maximum is 400 strings and maximum digits per string is seven) and a starting extension number corresponding to the first CO digit string. Once you confirm your changes, the system will update the translation table with sequential extension numbers that are associated with the sequence of CO digit strings. You can repeat this process, as needed, for other sequences of numbers.

6. When finished, press ESCAPE to return to the DID/DNIS block programming menu.
7. From the DID/DNIS block programming menu, select edit translation table, and press ENTER.

   The screen shows a translation table in which you can perform selective editing.

NOTE: If there are more numbers in the DID/DNIS block than the screen can show, the system places them on underlying pages. Press and hold CONTROL and type N or P to display each next or previous page. The table will form the screen so the CO digits are displayed in sequential order. You can add additional entries to the end of the table that will appear in sorted order the next time you access the table.

8. When finished, press ESCAPE twice
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE three times to return to main menu.

You can erase the entries in the translation table using the system default menu.

1. From the main menu, select system and press ENTER.
2. From the system menu, select defaults, and press ENTER.
3. From the defaults menu, select DID translation tables and press ENTER.
4. Type the DID/DNIS block number (1–4), and press ENTER. The system automatically removes all entries in the chosen table.
5. Press ESCAPE twice to return to main menu.

DID/DNIS Translation Table, Default

Description: You can clear programmed translation tables with this procedure.

Programming;

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select DID translation table and press ENTER.
5. Type DID/DNIS table number (1–4) and press ENTER.
6. Repeat step 5 until finished.
7. Press ESCAPE to end.

8.5 Ground Start Line Support

Description: The multipurpose line board (DXPCO-GD4, and GD8) provides system interface for loop start lines, ground start lines, and E and M tie lines. These are typically the three different line types that the central office (CO) makes available for connection to the public switched network.
With the ground start line type, the DXP momentarily grounds the ring lead to signal the CO to establish a communications link for an outgoing call. When the CO detects this, it acknowledges by momentarily grounding the tip lead. The DXP responds by removing its ground connection and bridging itself across the tip and ring leads. The CO then removes its ground connection and returns dial tone to the DXP.
For an incoming call, the CO grounds the tip lead and places an alternating voltage on the ring lead for the DXP to sense. If you set the incoming alert signal to its ring optional setting, the DXP detects tip-lead ground and then causes its ring generator to generate ringing to the station being called. If you set the incoming alert signal to its ring required setting, the DXP waits until the CO applies the alternating voltage before the DXP generates ringing to the station. When a station answers the ringing, the circuit is completed as it is for outgoing calls.
Because ground start lines are controlled at both ends, they are capable of a release supervision that provides a sure means of determining when a distant party hangs up his or her telephone. This is very important in applications where the system costs the calls. Also, since the signalling protocol indicates which end requests the line, it helps prevent call collisions and glare and thus is useful in applications where there is a high volume of incoming and outgoing calls occurring on the same lines.
Ground start lines are standard protocol for remote networking and are useful for connecting the DXP to private branch exchange (PBX) equipment. For ground start lines to be dependable, you must ensure that you have connected the DXP to a low resistant telephone company ground.

NOTE: The Federal Communications Commission (FCC) requires that you inform the central office that the DXP is configured as an MF (multipurpose) registered device if you connect it to ground start lines.

With ground start lines, set the following feature parameters:

-Incoming Alert Signal

- □ **For ring required**, the DXP must detect a ring signal on the line before it will send a ring signal to a station. This method is normally used with systems that use synchronized ringing to prevent a long first ring.
- □ **For ring optional**, the DXP sends a ring signal to a station as soon as it detects a ground on the tip lead of the line (put there by the calling equipment) or when it detects a ring signal on the line. This method allows the station to receive a ring signal in less time than the ring required method does; however, phantom ringing can occur on poorly grounded lines or lines that fail from the CO.

- Dialing Mode - Incoming Alert Signal
-Toll Groups -DTMF Level
- Busy Lead -Caller ID Active
- voice mail ID - Line Group

Programming: Refer to Section 8.5.1, *Ground Start Line Support Programming*.

8.5.1 Ground Start Line Support Programming

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number 1–128 or previously assigned name and press ENTER.
   The system displays page 1 of the line programming menu.
5. From line programming menu, type item number for line type and press ENTER.
6. Press SPACE bar to toggle line type and press ENTER.
7. From line programming menu, type item number for another parameter and press ENTER.
8. Respond to prompt action for feature setting, and press ENTER to accept setting.
9. Repeat steps 7 and 8 for all required parameters.
10. Press CONTROL and type N and the system will display the menu page 2 of line programming menu.

NOTE: The programming items shown on menu page 2 are for the line port type that you selected in step 7. These items will be different for each line type.

11. From menu page 2 of line programming menu, type item number for feature and press ENTER.
12. Respond to prompt line action for feature setting, and press ENTER to accept setting.
13. From menu page 2 of line programming menu, repeat steps 11 and 12 for all required choices.
14. When finished, press ESCAPE twice.
15. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
16. Repeat steps for each line port or press ESCAPE to end.

8.6 Loop Start Line Support

Description: The multipurpose line board (DXCPO-GD4, and GD8) provides system interface for loop start lines, ground start lines, and E and M tie lines. These are typically the three different line types that the central office (CO) makes available for connection to the public switched network. With the loop start line type, the DXP bridges a resistance across the tip and ring leads to signal the CO to establish a communications link for an outgoing call. The CO detects the resulting current flow and supplies dial tone to the DXP. The CO signals an incoming call to the DXP by placing an alternating voltage (ring signal) on the tip lead for the DXP to sense. The DXP then generates ringing to the DXP station being called. When a station answers the ringing, the circuit is completed as it was for outgoing calls. Loop start lines can not provide any sure means of determining when a distant party hangs up his or her telephone. For a system that experiences moderate incoming and outgoing call volume and does not cost calls, loop start lines provide an economical choice for connecting the DXP to the central office (CO) equipment. When you use line 1 for the power-fail mode, you must program that line to be a loop-start line unless the industry-standard telephone that you use as a power-fail station is a ground-start device.

With loop start lines, set the following feature parameters:

–Dialing Mode	–Abandon Hold Release	–Positive Disconnect Time
–Toll Groups	–DTMF Level	–Busy Lead
–Disconnect Supervision	–Caller ID Active	–Voice Mail ID
–Line Group		

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number 1–128 or previously assigned name and press ENTER. The system displays page 1 of the line programming menu.
5. From menu page 1 of line programming menu, type item number for line type and press ENTER.
6. Press SPACE bar to toggle line type (choose loop start, ground start, or E and M tie line) and press ENTER.
7. From menu page 1 of line programming menu, type item number for another line parameter, press ENTER.
8. Press SPACE bar for feature setting, and press ENTER to accept setting.
9. From menu page 1 of line programming menu, repeat steps 8 and 9 for all required choices.
10. Press CONTROL and type N and the system will display the menu page 2 of line programming menu.

NOTE: The programming items shown on menu page 2 are for the line port type that you selected in step 7. These items will be different for each line type.

11. From menu page 2 of line programming menu, type item number for feature and press ENTER.
12. Press SPACE bar for feature setting, and press ENTER to accept setting.
13. From menu page 2 of line programming menu, repeat steps 11 and 12 for all required choices.
14. When finished, press ESCAPE twice.
15. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
16. Repeat steps for each line port or press ESCAPE to end.

8.7 Tie Line Support

The multipurpose line board (DXCPO-GD4, and GD8) provides system interface for loop start lines, ground start lines, and E and M tie lines. These are typically the three different line types that the central office (CO) makes available for connection to the public switched network. The tie line connections (also known as tie trunk access) are special circuits that allow, on either a dial-up or a continuous connection (hot line) basis, the DXP to communicate with remotely located equipment such as: another DXP, a PBX, or other common carrier (OCC) equipment for long distance calls.

NOTE: Tie lines are primarily for incoming calls to a DXP and depend upon software controlling the remote site.

Tie lines can be a part of a private or leased network and can be metallic, carrier current, T1, or microwave. The E and M line provides control signalling between local and remote systems. When a local DXP puts a request for service on the M lead, the remote equipment detects this request on its E lead. As an option it can also respond by putting an alerting signal on its M lead.

8.7.1 Tie Line Parameters

Tie Line Types (Connect Mode)

Description: The DXP supports two different types of E and M lines. The E and M Direct type is for direct connection between two telephone systems and is also known as a metallic connection. The E and M Carrier type is for tie lines that run through a central office (CO) interface; however, some COs also provide a metallic connection interface.

Programming: Refer to Section 8.7.2, *Tie Line Support Programming*.

Tie Line Standard-Protocol Signalling (Control Signalling)

Description:

The system can respond to either one of three different standard-protocols of E and M signalling. They are known as: immediate signalling, wink signalling, and delayed signalling. You must program the desired protocol type to match that provided by the CO or the remote equipment.

Immediate Signalling: With this signalling method, the called DXP answers as soon as the calling DXP initiates the call. This signalling method is usually used if the line is programmed for hot line operation or is programmed for pulse dialing. It is best to avoid this type of signalling in any other circumstances.

Wink Signalling: With this signalling method, the called DXP places a momentary signal reversal (wink) on its M lead to alert the calling DXP system that it is ready to receive information. The calling DXP controls the status of the M lead and watches for a return signal from the called DXP on the E lead. A wink occurs when the called DXP is ready to receive dialed digits from the calling DXP. Dialing can begin only after the wink is complete. After the wink occurs, the called DXP (if it is programmed for dialing) returns dial tone to the calling DXP as an indication it is ready to receive digits. This signalling method is the preferred protocol for use between two DXP systems.

Delayed Signalling: With delay dial signalling, the called DXP immediately responds to the calling DXP by sending an off-hook signal on its M lead. It holds this off-hook condition until it is ready to receive digits and then returns its M lead to on-hook. After this signal exchange occurs, the called DXP (if it is programmed for dialing) returns dial tone to the calling DXP as an indication it is ready to receive digits. This signalling method is most useful if the DXP is connected to another manufacturer's PBX with incompatible wink timing parameters.

Programming: Refer to Section 8.7.2, *Tie Line Support Programming.*

Tie Line Non-Standard Protocol Signalling (Line Access)

Description: You can program the system to respond to two types of non-standard tie line signalling protocols. They are known as hot line and intercom dialing.

Hot Line: You can program the system for hot-line operation so that as soon as a user accesses the tie line, the station or stations at the distant system that have access to the personal or group intercom assigned to the hot line will ring. If you arrange for access by hot line, you must enter the extension that will automatically ring when the tie line is seized by the calling DXP. If you do not enter an extension, the system will ring the dial 0 station, and if it is unavailable, the system will return dial tone to the caller.

Intercom Dialing: Alternately, you can program the system for intercom dialing mode so that as soon as users access the tie line they will hear dial tone. Upon hearing dial tone, they can dial either a personal or group intercom number at the distant system.

NOTE: Intercom feature codes of one DXP are not available to callers from the other DXP nor can those callers access a line through the distant DXP using line group access codes.

Programming: Refer to Section 8.7.2, *Tie Line Support Programming.*

Automatic Number Identification (ANI) Delivery

Description: Automatic Number Identification (ANI) is a T1 service feature for both E&M and DID lines. Long distance common carriers offer ANI as a feature to dial 800 and dial 900 lines. The ANI feature provides information to an internal telephone system that identifies the telephone number of the calling party. Businesses served by a dial 800 or dial 900 service allow any available user to answer the calls and have their internal telephone system process the ANI information to identify the caller's telephone number.

The common carrier supplies ANI information as DTMF digits. When the ANI feature is combined with the Dialed Number Identification Service (DNIS) feature, the common carrier also delimits the DNIS information from the ANI information with an asterisk (S) tone so that the DXP can process each portion properly.

The DXP system decodes the ANI information and sends the caller's number to the called telephone and to the SMDR/SMDA line reports. If the called telephone is an LCD speakerphone, its display shows the caller's number. This display is shown for all conditions (that is, transferred calls, call forward and so forth). The DXP also sends the calling number information to the SMDR/SMDA line report and makes the information available to devices that are connected to the DXP's Open Architecture Interface (OAI).

When you assign ANI to lines that callers reach by dialing access codes, the DXP processes all incoming digits as ANI digits until it encounters the delimiter. The DXP then processes the remainder of the incoming digits as DNIS call routing digits. When you assign ANI to lines that callers reach without dialing any digits (such as, E&M hot line or DID lines with 0 digits expected), the DXP processes all incoming digits as ANI digits until it encounters the end delimiter. The DXP then routes the call to one of the following intercom numbers: the one that services the E&M hot line number, the one that serves as the DID/DNIS default, or the one that serves as th operator for the system.

The DID, E&M DNIS, and E&M tie lines all can access the Direct Inward System Access (DISA) feature when the caller dials the DISA access code or when the DID/DNIS digits translate to the DISA access code. The system distinguishes the DISA code from the preceding ANI information.

Since the DXP supports ANI only on tone dial lines, is supports both wink start and delay start protocols but does not support the immediate start protocol.

Programming: Use the Section 8.7.2, *Tie Line Support Programming,* procedure to enable DXP processing of ANI information for tie lines and program the tie line attributes.

Call Announce

Description: This feature, when enabled, allows tie line callers from outside the system to voice announce incoming calls to the DXP station after they hear an alert tone. You must also arrange the DXP system to respond to voice announce intercom calls.

Programming: Refer to Section 8.7.2, *Tie Line Support Programming.*

Dialing Mode

Description: Program the tie line to match either a DTMF tone or a rotary (pulse) dialing line as supplied by the central office (CO).

Programming: Refer to Section 8.7.2, *Tie Line Support Programming.*

Toll Groups

Description: You must identify the tie lines that you do not want users to use when they dial toll restricted numbers. Do this by first assigning the tie lines to toll groups and then assigning those toll groups to the restricted number. There are 32 toll groups available for line assignment. Assign one, several, or all lines to any desired toll group or combination of toll groups as needed. See Section 11 for complete toll restriction programming details.

Programming: Refer to Section 8.7.2, *Tie Line Support Programming.*

DTMF Level

Description: Adjust the audio level of the tie line's DTMF signals to a low (-5 db), medium (0 db), or high (+3 db) setting. Certain sites may require a higher db level to over come line conditions that could interfere with reliable dialing.

Programming: Refer to Section 8.7.2, *Tie Line Support Programming.*

DISA

Description: Enable or disable DISA capability on the tie line.

Programming: Refer to Section 8.7.2, *Tie Line Support Programming.*

DISA Voice Options

Description: Use the DISA Voice Options 1 through 4 to select digital voice announce (DVA) message levels. For example, selecting DISA voice option 2 will cause welcome greeting 2, day main menu 2, night main menu 2, recall no answer 2, and recall busy 2 prompts to play whenever a DISA-configured tie line is covered by DVA. Refer to Section 14.3, *Digital Voice Announce Programming* for complete DVA programming details.

Programming: Refer to Section 8.7.2, *Tie Line Support Programming.*

8.7.2 Tie Line Support Programming

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number 1–128 or previously assigned name and press ENTER.
   The system displays page 1 of the line programming menu.
5. From line programming menu, type item number for line type and press ENTER.
6. Press SPACE bar to toggle line type and press ENTER.
7. From line programming menu, type item number for another line parameter, press ENTER.
8. Respond to screen prompt action for feature setting, and press ENTER to accept setting.
9. Repeat steps 7 and 8 for all required parameter choices.
10. Press CONTROL and type N and the system will display the menu page 2 of line programming menu.

NOTE: The programming items shown on menu page 2 are for the line port type that you selected in step 7. These items will be different for each line type.

11. From menu page 2 of line programming menu, type item number for feature and press ENTER.
12. Respond to screen prompt action for feature setting, and press ENTER to accept setting.
13. Repeat steps 11 and 12 for all required parameter choices.
14. When finished, press ESCAPE twice.
15. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
16. Repeat steps for each line port or press ESCAPE to end.

8.8 Direct Inward System Access (DISA) Programming

Through the DISA programming routines, you can configure a system to allow outside callers to call directly into the system. DISA callers can dial authorization codes that allow them to use the system's features that are normally available only to inside callers.

NOTE: It is possible to use the automatic route selection (ARS) feature (Section 12, Enabling Automatic Route Selection*) along with the DISA feature to route DISA calls that pass through the system. If you enable this application, you may need to add pauses in the ARS modify digits table (Section 12.4.4,* ARS Modify Digits Table*) to account for the time delay the system experiences in obtaining the CO dial tone. The amount of time delay varies for each installation; therefore, you must test your installation to determine the time required to obtain a CO dial tone when using the DISA feature. You can then adjust the system timing pause time or add multiple pauses to offset this delay.*

8.8.1 DISA Specific Programming

Description: The purpose of the DISA specific programming is to perform the following tasks:

- Enable extensions where day/night DISA calls will be routed when call-routing is necessary,
- Enable proprietary voice mail to receive DISA calls and route the calls to a dedicated mailbox that holds the appropriate intercept greetings,
- Select access lockout time (the amount of time that the line remains locked-out from use after invalid conditions occur—such as, when a caller repeatedly dials an invalid authorization code),
- Select the timeout period for DISA extensions that ring without answer (RNA),
- Select the maximum timeout period for the reminder tone that sounds during an in-process call when the DISA caller is using an outside line and the system has no disconnect supervision. This tone sounds at set intervals to remind the caller that he or she must dial a code (any single digit) or be disconnected within 10 seconds,
- Select the option to either route a DISA call or drop it after caller dials an invalid authorization code

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select Lines and press ENTER.
3. From the lines menu, select DISA configuration and press ENTER.
4. From the DISA configuration menu, select Day Routing Extension and press ENTER.
5. Type day routing extension number and press ENTER.
6. Type night routing extension number and press ENTER.
7. Type voice mail Routing ID (up to eight digits) and press ENTER.
8. Toggle the SPACE bar to select access lockout times (2, 5, 10, 15, 30 minutes) and press ENTER.
9. Type the ring no answer (RNA) rings of 0 through 9, and press ENTER.
10. Toggle the SPACE bar to select Maximum Reminder Timeout periods of (2, 5, 10, 15, 30 minutes) and press ENTER.
11. Toggle the SPACE bar to select Route or Drop from Route/Drop Invalid Access field and press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
13. Press ESCAPE to end.

8.8.2 DISA And DISA Voice Options *(Enabling Or Disabling DISA Lines)*

Description: Use the following programming instructions to enable or disable DISA capability on lines 1 through 128. Also, use the DISA Voice Options 1 through 4 to select digital voice announce (DVA) messages. For example, selecting DISA voice option 2 will cause welcome greeting 2, day main menu 2, night main menu 2, recall no answer 2, and recall busy 2 prompts to play whenever a DISA line is covered by DVA. Refer to Section 14.3, *Digital Voice Announce Programming*, for complete DVA programming details.

Programming

1. Press CONTROL T for main menu.
2. From main menu, select Lines and press ENTER.
3. From the lines menu, select Line Programming and press ENTER.
4. Enter line number you want to program and press ENTER.
5. From the line (number) programming menu (page 2), select DISA and press ENTER.
6. Toggle the SPACE bar to select/deselect DISA and press ENTER.
7. Enter 1 through 4 for the DISA Voice Options and press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Enter the number for the next line you want to program or press ESCAPE to end.

8.8.3 Programming DISA Authorization Codes

Description: DISA callers with assigned authorization codes have access to advanced system features. Authorization codes are associated with either personal or group intercom numbers; therefore, when a DISA caller enters his or her authorization code, the code alerts the system as to what features to make available to the caller. Once callers access features with authorization codes, the access remains in effect until any idle time exceeds the authorization code time-out period. Use this programming procedure to assign or modify authorization codes and to tie the authorization codes to accompanying intercom numbers. Use the Section 8.8.4, *Remote COS Programming*, procedure to assign a station class of service to the intercom numbers.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR menu, type item number for authorization codes and press ENTER.
4. From authorization code menu, type line number to add, remove, or modify authorization codes and press ENTER.
5. Type authorization code (up to 6 digits) and press ENTER.

NOTE: You can include a programmed pause as part of the authorization code by typing a p at the point in the code where you wish a pause to occur. If you include a pause, a user must wait the programmed pause time at the proper point when he or she dials the DISA authorization code because the pause is now part of the code.

6. If adding or modifying a code, type intercom number that it is associated with and press ENTER.
7. When finished, press ESCAPE once.
8. Type item number to display authorization codes for review and press ENTER.
9. When finished, press ESCAPE to end.

8.8.4 Remote COS Programming

Description: DISA callers that have assigned authorization codes have access to advanced system features. The features that they have access to are controlled by the station class of service that you assign with this programming procedure. The intercom number that is associated with this remote COS assignment is the same intercom number that is associated with the caller's DISA authorization code that you set using the Section 8.8.3, *Remote DISA Authorization Codes*, procedure.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select Intercom number and press ENTER.
3. From Intercom menu, select Modify Intercoms and press ENTER.
4. Enter intercom number and press ENTER. (Remember, this is the intercom number that you set in Section 8.8.3, *Remote DISA Authorization Codes*, to correspond with the DISA authorization code.)
5. Select Remote COS and press ENTER.
6. Enter station class of service number 1–32 and press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

8.8.5 Remote Day Exception Number/Night Exception Number

Description: A DISA caller may have access to an outside line where the toll restriction is based on the DISA authorization code that is associated with a particular class of service. Remote day and remote night exception numbers allow DISA callers to dial numbers that their toll restriction normally prevents them from dialing. If a toll restriction table exception number matches one of the exception numbers that you assign using this procedure, the system allows the DISA caller to dial the number.

The exception number values that you can assign are 1 through 32 and NONE. You can assign 32 exception numbers to each DISA class of service. You also must assign one exception number to each toll restriction table line entry (Section 11.7, *Exception Number Programming*).

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for day exception number and press ENTER.
6. Type day exception number (0–32) (n, nn, n–nn, or 0 for none) and press ENTER.
7. Repeat step 6 for night exception number.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

8.8.6 Pad Level—DISA (Gain Setting For DISA Lines)

Description: Callers that use the DISA feature to access a trunk group and place calls (trunk–to–trunk calling) may experience low audio levels on their calls due to the normal line resistance of CO lines. While low audio level is usually only noticeable on long line loops. software release 8C adds +3dB of gain to the DISA lines as a default setting, and provides a means for you to disable this gain if necessary.

The software enhancement also provides a means by which DISA callers can preselect the gain on a DISA line before they select the line for use. They can dial a code to select either 0dB, +3dB, or +6dB of gain.

NOTE: The unamplified line-to-line DISA connections often exhibit low audio levels due to double loop copper losses. While adding gain to these connections will sometimes improve audio signal levels, the added gain may also result in circuit instability in some connections. This instability presents itself as a singing sound that can interfere with dialing or voice communications. If callers experience dialing problems or hear singing in their calls, you may need to disable the pad level for the DISA line or they may need to select a lower gain setting for use.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From line programming menu, type item number for pad level—DISA and press ENTER.
6. Press SPACE bar for feature setting and press ENTER
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–7 for each line or press ESCAPE to end.

8.9 Programming The T1 Parameters

Description: When the system is using the T1 option, you can program status and alarm alerting parameters. Also, you can program the DXP loss insertion that affects audio levels in the individual T1 channels. The specific programming instructions for the T1 parameters are shown in the following list:

- enable T1 status reporting and major alarm alerting,
- program status log parameters,
- program major alarm alerting parameters,
- assign system status button to station,
- print and clear the status log,
- program DXP loss insertion.

8.9.1 Enabling T1 Status Reporting And Major Alarm Alerting

Description: Use the following instructions to enable the T1 status reporting and major alarm alerting features. Use the Section 8.9.2, *Programming The Status Log Requirements*, and Section 8.9.3, *Programming The Major Alarm Alerting Parameters*, procedures to program the status reporting and alarm alerting parameters.

Programming:

1. Press CONTROL T to return to main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select system parameters and press ENTER.
4. From the system parameters menu,
   – select T1 status reporting, and press space bar to select enabled.
   – select major alarm alerting and press space bar to select enabled
5. When finished, press ESCAPE twice.
6. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
7. Press ESCAPE to end.

Relays *(External T1 Alarm Reporting)*

Description: Assign one of the four relays located on the central processor board to alert system users if a T1 alarm occurs. Typically, installers wire the relay to control loud bells or other external ringers, but they can use visual devices if desired. Specified users, upon hearing this alarm, can dial a feature code to turn off the alarm. Generally, you should use relays 2–4 for this purpose since they are normally open. Because relay 1 is normally closed, you must use a specially configured device when using this relay.

Programming:

1. Press CONTROL T to return to main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select paging zones and press ENTER.
4. From the paging zones menu, select relays and press ENTER.
5. From the relays menu, select 1-4 and press ENTER.
6. From the relay n menu, type item number for major alarm ring and press ENTER.
7. Press space bar to select options.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE to end.

8.9.2 Programming The T1 Status Log Parameters

Description: Use the following instructions to program the T1 status log parameters.

Programming:

1. Press CONTROL T to return to main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select T1 status log parameters and press ENTER.
4. From the T1 status log parameters menu, select the row number for the error type you want to program. The cursor will move to the threshold entry field for that error type. Select any of the following threshold values:
   0 = never log the alarm
   1 = always log the alarm
   (2 to 999) = check this number of alarm occurrences during the selected time period and decide whether or not to log the alarm. (The maximum threshold for the bipolar and CRC alarm trigger is 255.)
5. After making your entry for the alarm threshold, press ENTER to advance to the next line in the threshold entry field, or press TAB to advance to the time period entry field.
6. With the cursor in the time period entry field, toggle through the choices using the space bar. When the system displays the time period you want to use, press ENTER to go to the next line in the time period entry field, or press TAB to advance to the next line in the threshold entry field.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

8.9.3 Programming The Major Alarm Alerting Parameters

Description: Use the following instructions to program the audible alarms for the various T1 system errors.

Programming:

1. Press CONTROL T to return to main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select major alarm alerting and press ENTER.
4. Select the error type you want to program. The cursor will move to the threshold entry field for that error type. From the threshold entry field, select any of the following threshold values:
   0 = never go to alert status
   1 = go to alert status if the alarm is ever logged
   2 to 999 = check this number of occurrences during the selected time period to decide whether or not to elevate the alarm to alert status.
5. After making the alarm threshold entry, press ENTER to advance to the next line in the threshold entry field, or press TAB to place the cursor in the time period entry field.
6. With the cursor in the time-period entry field, toggle through the choices using the space bar. When the system displays the time period you want to use, press ENTER to go to the next line in the time period entry field, or press TAB to advance to the next line in the threshold entry field.
7. Press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

8.9.4 Assigning A System Status Button To A Station

Description: Use the following instructions to program a system status button.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select button mapping and press ENTER.
4. Type prime intercom number or previously assigned name and press ENTER. (Screen presents current button map for review.)
5. Type first level button code (L1–L25, 0–9) and press ENTER.
6. Type mnemonic of feature (SYSST) and press ENTER
7. When finished, press ESCAPE twice.

8.9.5 Printing The Status Log

Description: Use the following program to print a system status log, a T1 status log, or both. This program gives you the choice of printing the log to your VDT screen or a printer.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select printouts and press ENTER.
3. From printouts menu, select status log printout and press ENTER.
4. Type s for screen printout or p for hard copy printout through the SMDA/SMDR data printer and press ENTER.

NOTE: Press CONTROL C to stop a printout to the VDT screen when necessary. This action will not stop printout to a data printer.

5. When printout is finished, press ESCAPE to return to printouts menu.
6. Repeat steps 3–6 for next desired printout or press ESCAPE to end.

8.9.6 Clearing The Status Log

Description: The following program allows you to clear either the system status log, the T1 status log, or both.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select defaults and press ENTER.
4. From defaults menu, select system and press ENTER.
5. From the system defaults menu, select clear status logs and observe prompt.
6. From prompt, select system status log, T1 status log or both.
7. Type y to confirm default or n to deny.
8. Press ESCAPE once to end the programming session.

9 Programming Intercom Numbers

- Modifying Intercom Numbers 9.1
- Adding Intercom Numbers 9.2
- Removing Intercom Numbers 9.3
- Renumbering Intercom Numbers 9.4

The system provides a maximum of 600 intercom slots with 192 slots set up as personal intercom numbers. This means that the system provides up to 408 group intercom numbers. Group intercom numbers are four digits and begin with number 3101. At default, the blocks of intercom numbers are assigned as follows:

101–292 = personal intercom numbers
3101–3292, 4101–4292, 5000–5023 = group intercom numbers
5024–5999 = unassigned—used for renumbering purposes
600–899 = feature codes

Remember, the system numbers the station ports and defaults the personal intercom numbers beginning with the station board located in the left-most slot nearest the central processor unit (CPU) circuit board (station port 1 is personal intercom number 101 and so forth). If a station slot is unavailable (the system includes an auxiliary board for instance), that block of personal intercom numbers are unavailable for use until you use the Section 9.4 procedure to re-number the unavailable intercom numbers. For example, if the slot that provides station ports 1–8 (intercom 101–116) is occupied by a DXAUX board and you wish to retain that intercom block, you can arrange station ports 17–192 to begin at intercom 101.

9.1 Modifying Intercom Numbers

Description: Use this programming procedure to modify intercom numbers and station names. A display name is composed of a maximum of seven characters and shows in the display of an LCD speakerphone as a identification aid. A full name is composed of a maximum of 20 characters and shows in some voice mail and open architecture interface applications. You can compose a valid name from any alpha-numeric character; however, the first character of a display name must be an alphabetic character. Refer to Section 7.2.2, *Display Name/Full Name*, for the creating station names procedure.

Programming:

1. Press CONTROL T for the main menu.
2. From main menu, select intercom numbers and press ENTER.
3. From intercom numbers menu, select modify intercoms and press ENTER.
4. Type the intercom number to be modified and press ENTER.
5. Type the row number for extension and press ENTER.
6. Type the new intercom number and press ENTER.

NOTE: You can select a new intercom number from 5024 to 5999 if the system's intercom numbers are at default; however, you can select any four-digit intercom number if you remove dialing conflicts that the system prompts you about.

7. Type display name (a–z, A–Z, 0–9, punctuation, special characters, and so forth) and press ENTER.
   A display name can be up to seven characters long.
8. Type full name (a–z, A–Z, 0–9, punctuation, special characters, and so forth) and press ENTER. A full name can be up to 20 characters long.
10. Type remote COS (1–32) and press ENTER.
    Refer to Section 8.8.4, *Remote COS Programming*, for remote COS details.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–8 for each intercom number or press ESCAPE to end.

9.2 Adding Intercom Numbers

Description: Use the procedure to add intercom numbers.

Programming:

1. Press CONTROL T for the main menu.
2. From main menu, select intercom numbers and press ENTER.
3. From intercom numbers menu, select add intercoms and press ENTER.
4. Type intercom number to be added and press ENTER.
5. Type g for group intercom or p for personal intercom and press ENTER.
6. Type the station port number (1–192) and press ENTER.
7. If a prompt line indicates a conflict, type y to overwrite or n to reject and press ENTER.
8. Press ESCAPE to end.

9.2.1 Group Intercom Access

Description: Use this procedure to add group intercom numbers to stations for their use. Also refer to Section 7.3, *Square/Nonsquare System–Button Mapping By Station*, to map buttons for group intercom number selection.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type a for add or r for remove and press ENTER.
7. Type group intercom numbers (type nnnn,nnnn, nnnn or type nnnn–nnnn) and press ENTER.
8. When finished, press ESCAPE three times.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 4–9 for each station or press ESCAPE to end.

9.2.2 Intercom Hunt List

Description: Place personal intercom and group intercom numbers in a list with this programming procedure. Calls to a busy hunt list number will search the list for an idle number at which to ring. Up to eight intercom numbers are allowed in a hunt list. These can be all group intercom numbers or one personal intercom number and seven group intercom numbers. Do not place the same group intercom number in more than one hunt list.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type intercom numbers for list (up to eight allowed separated with commas - include the personal intercom of station being programmed for intercom call hunting; otherwise, only line calls to the station will hunt) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each station or press ESCAPE to end.

9.3 Removing Intercom Numbers

Description: Use this procedure to remove intercom numbers.

NOTE: If you remove or renumber an intercom number, be sure that you do not use the old intercom number in button mapping, hunt lists, call forwarding and similar applications.

Programming:

1. Press CONTROL T for the main menu.
2. From main menu, select intercom numbers and press ENTER.
3. From the intercom numbers menu, select remove intercoms and press ENTER.
4. Type intercom number to be removed and press ENTER.
5. Press ESCAPE to end.

9.4 Renumbering Intercom Numbers

Description: *Use this procedure to renumber one intercom number or a block of intercom numbers*

NOTE: If you remove or renumber an intercom number, be sure that you do not use the old intercom number in button mapping, hunt lists, call forwarding and similar applications.

Programming:

1. Press CONTROL T for the main menu.
2. From main menu, select intercom numbers and press ENTER.
3. From the intercom numbers menu, select renumber and press ENTER.
4. Type station ports 1–192 (type as n, nn, nnn or n–nnn) to renumber and press ENTER.
5. Type the beginning intercom number in the series to be assigned to the block and press ENTER.
6. Press ESCAPE to end.

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10 Programming Call Costing and Station Message- Detail Accounting and Reports *(SMDA/SMDR Programming)*

- SMDA/SMDR Parameters 10.1
- SMDA Reports 10.2
- Account Codes (Forced with Positive Verification) 10.3
- Emergency Numbers 10.4
- Authorization Code 10.5

10.1 SMDA/SMDR Parameters

10.1.1 Dial Time Limit

Description: Program the amount of time that the system ignores for dialing purposes . The system does not cost dialing time when it records the time of a call for costing purposes. Refer to Section 12.5, *Costing Information (ARS)*, for related call costing information.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR programming menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.1.2 Answer Time Limit

Description: Program the amount of time that the system waits before beginning to cost a call. This time allows for a call to ring and be answered before being costed. Refer to Section 12.5, *Costing Information (ARS)*, for related call costing information.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR programming menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.1.3 SMDR Print Parameter

Description: When you turn on the SMDR with this programming action, the system provides continuous printout of system-wide station call activity as it is collected. You can arrange for the printout to include the cost of each reported call or to report the calls without the costing information. Refer to Section 12.5, *Costing Information (ARS)*, for related call costing information.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR programming menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.1.4 SMDR Record Format

Description: Choose either a station message detail report (SMDR) format or a station message detailed accounting (SMDA) format for the report. This section and Section 10.2.1, *Automatic Reports*, include examples of some typical reports for your reference.
The system presents each record in an 80-column format and ends it with a carriage return/line feed. The following chart details the formats for both SMDR and SMDA records.

SMDR Records

Column	Value	Format	Justification
1–4	station number	nnnn	left
6–8	line number	nnn	right
9–11	not currently used		
13–20	month/day/year	nn/nn/nn	right
22–26	time call was initiated (24-hour)	nn:nn	right
29–33	call duration (minutes and tenths or NOANS)	nnn.n	right
36–39	ring time (incoming call)	nn.n	right
43–58	digits dialed on line (maximum of 16)	nnnn. . . n	left
65–71	call cost (if enabled)	$nnn.nn	right

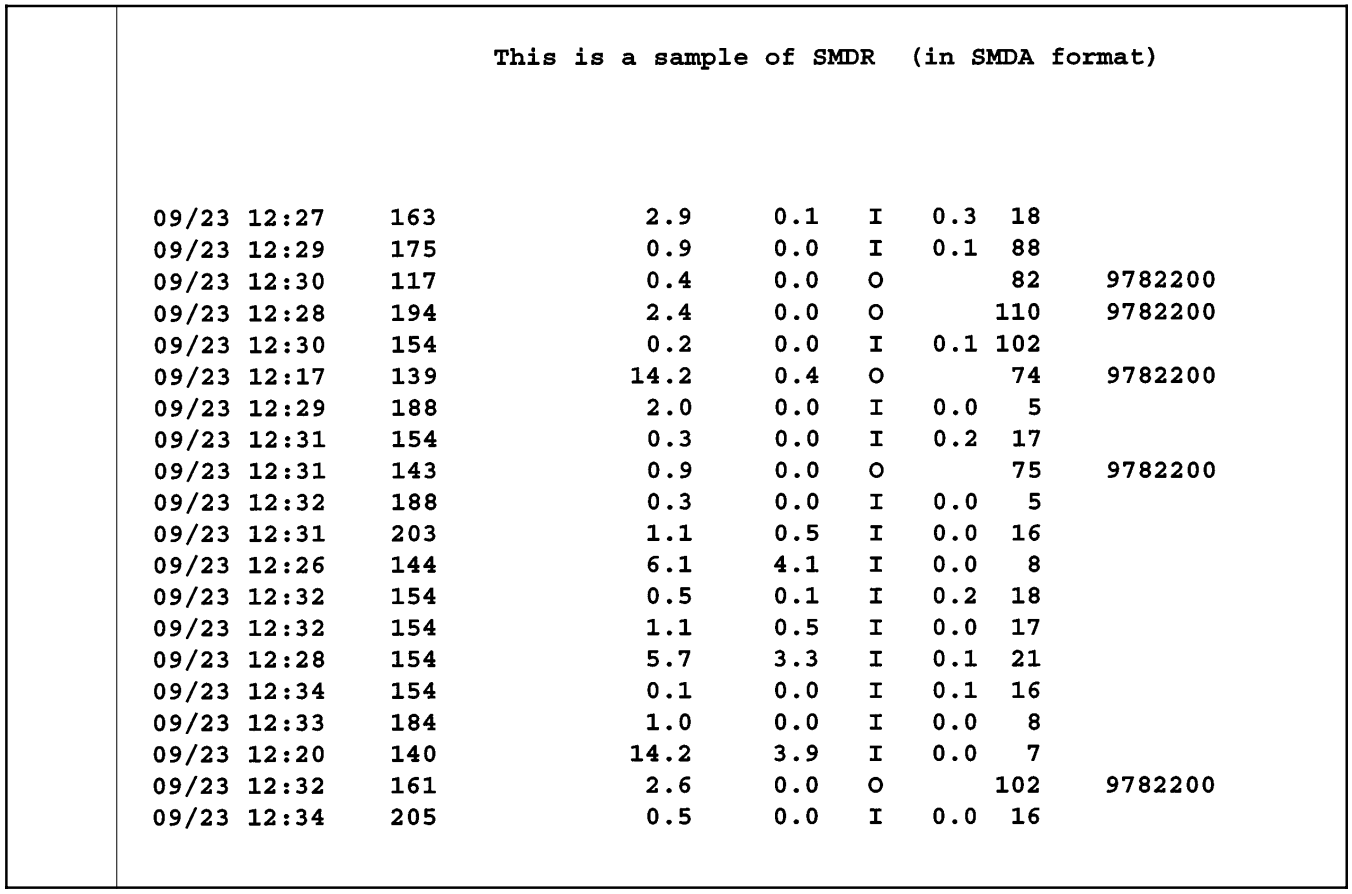
SMDA Records

Column	Value	Format	Justification
1–5	month/day	nn/nn	left
7–11	time call was initiated (24-hour)	nn:nn	left
15–18	station number	nnnn	right
21–28	account code (two lines if greater that 8 digits)	nnnnnnnn	right
30–34	call duration (minutes and tenths or NOANS)	nnn.n	right
37–43	call cost	$nnn.nn	left
46–46	call type (I = incoming, O = outgoing)	n	left
47–48	not currently used		
49–52	ring time (incoming call)	nn.n	right
54–56	line number	nnn	right
57–59	caller ID line	ID	left
61–76	digits dialed on line (maximum of 16)	nnnn . . . n	left

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR programming menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

Operation: INTERCOM ✻ # 0 ✻ 82 then dial code
1 = all records 5 = department records
2 = station reports 6 = automatic reports
3 = line reports 7 = delete all records
4 = account code reports

SMDR Record Sample Shown In SMDA Format



This is a sample of SMDR (in SMDA format)

09/23 12:27	163	2.9	0.1	I	0.3	18	
09/23 12:29	175	0.9	0.0	I	0.1	88	
09/23 12:30	117	0.4	0.0	O		82	9782200
09/23 12:28	194	2.4	0.0	O		110	9782200
09/23 12:30	154	0.2	0.0	I	0.1	102	
09/23 12:17	139	14.2	0.4	O		74	9782200
09/23 12:29	188	2.0	0.0	I	0.0	5	
09/23 12:31	154	0.3	0.0	I	0.2	17	
09/23 12:31	143	0.9	0.0	O		75	9782200
09/23 12:32	188	0.3	0.0	I	0.0	5	
09/23 12:31	203	1.1	0.5	I	0.0	16	
09/23 12:26	144	6.1	4.1	I	0.0	8	
09/23 12:32	154	0.5	0.1	I	0.2	18	
09/23 12:32	154	1.1	0.5	I	0.0	17	
09/23 12:28	154	5.7	3.3	I	0.1	21	
09/23 12:34	154	0.1	0.0	I	0.1	16	
09/23 12:33	184	1.0	0.0	I	0.0	8	
09/23 12:20	140	14.2	3.9	I	0.0	7	
09/23 12:32	161	2.6	0.0	O		102	9782200
09/23 12:34	205	0.5	0.0	I	0.0	16	

SCREEN1.EPS

10.1.5 *Account Code* (System Parameters)

Description: Account codes are used to identify calls by category or by any other desired grouping, so that the system can record costing by that category. You can arrange the system to force the user to enter an account code and have the system verify it before it allows the user to make a call. Turn on the account code feature for the entire system using this procedure. Also, enable or disable system verification of the entered code. If you enable verification, the system compares the account code entered by a station user with the programmed account code entries that you have assigned. If the system does not find a match and you have enabled the forced account code feature through station class of service, the system prevents any further dialing until the user enters a matching account code. If you have not enabled verification, the system does not check the entered account code for a match. See Section 10.3, *Account Codes*, for further account code programming details.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for desired value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.1.6 Account Code Display And Account Code Display Time

Description: As a feature to LCD speakerphone users, a message appears in the telephone's display to prompt the user to enter an account code during incoming and outgoing calls. If the system does not require such a prompt (for example, because the account code feature is disabled), turn off the prompting message display with this programming operation. If the system does require the prompting display and you enable it using this procedure, also set the length of time that the prompt shows on the user's display. See Section 10.3, *Account Codes*, for further account code programming details.

NOTE: When the account code display is on, the user must enter an account code within the display time when he or she is making an outgoing call; otherwise, the system will drop the line.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR menu and press ENTER.
3. From SMDA/SMDR menu select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE once.
7. If you enabled the display, continue with step 8. If you disabled the display, press ESCAPE once and continue with step 11.
8. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
9. Press SPACE BAR for time.
10. When finished, press ESCAPE twice.
11. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.1.7 Account Code Length

Description: An account code can be a minimum of three digits or a maximum of 16 digits. Use this procedure to set the amount of account code digits. See Section 10.3, *Account Codes*, for further account code programming details.

NOTE: If you change the account code length you will delete all currently programmed account codes.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press.
3. From SMDA/SMDR menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Type the account digit amount (3–16).
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.1.8 SMDA Attendant Delete

Description: Use this programming feature to provide the system attendant with the ability to delete SMDA records from the system memory.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR programming menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

Operation: INTERCOM ✻ # 0 ✻ 827

10.1.9 SMDA/SMDR Printer Port

Description: Use this programming feature to determine which serial data port the system will route its generated SMDA/SMDR through.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR programming menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Type data port number (1–18) and press ENTER.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.1.10 Report Option

Description: You can arrange for the SMDR/SMDA parameters to convey either the cost of calls that the stations make or the amount of time that lines have been on hold at the stations.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR programming menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.1.11 SMDR Record

Description: When you enable this feature, the system stores SMDR records for the specified line.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From line programming, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each line port or press ESCAPE to end.

10.1.12 Secure Account Code Display

Description: Software release 8C enhances the SMDA/SMDR feature. Prior to software release 8C when a caller dials his or her account code, the LCD speakerphone displays the dialed digits. With software release 8C, you can activate the secure account code display that causes the LCD speakerphone to display an ✻ for each digit instead of the dialed account code digits.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR programming menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for secure account code display and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.2 SMDA Reports

Description: The SMDA feature allows the system to store various call records and generate reports of these records for printout. Use the following programming procedure to manually command a printout to occur. These reports include either station, line, account codes, or all of the above. When the system generates a station report, it will generate a separate report for any and all stations that have had outside call activity.

The station report shows all calls that the station user has made and received along with totals and averages. Line reports show the totals for each active line in the system.

The line report shows the number of calls, total minutes busy, number of incomplete calls, and cost for each line. The line report also summarizes line group activity as well.

The account code report provides the same information as the station report except the records are based upon each account code.

The all record report sends all stored SMDA records to the serial data port. This report is not in groups as is the station, line or account code reports but rather is in a chronological order.

You can view the number of free records or you can delete all stored SMDA records to insure that only the latest SMDA reports are being stored or to provide a known starting port for record storage. Prior to this release, you or the system user could only make this selection from a programming station using the system manager and attendant programming procedure.

NOTE: If your programming terminal shares the same port as your data printer and you command it delete all records, the system will not take this action until you log out of the VDT programming mode.

In addition to this manual report command, you can also request the system to generate reports automatically on a timed basis. Refer to Section 10.2.1, *Automatic Reports,* for details about automatic reports and to Section 10.2.2 for some typical report examples. Further, you or the system user can employ the system manager and attendant programming procedure to request reports at a programming station. Finally, the system will automatically generate an automatic report when its memory nears its saturation point (95 percent full).

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select printouts and press ENTER.
3. From printouts menu, select SMDA/SMDR and press ENTER,
4. From SMDA/SMDR menu, select SMDA reports and press ENTER.
5. From SMDA reports menu, select desired report and press ENTER.

NOTE: If you select the delete records option and your VDT is installed in the printer port, the system will not delete the SMDA records until you log out from the programming mode.

6. Press ESCAPE to end.

10.2.1 Automatic Reports (SMDA)

Description: Program the system to automatically provide call cost reports for printing.
- Choose the day and time that the printout is desired.
- Choose the type and detail of each report.
- Dictate whether the call records are to be erased from the system memory after they are printed.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select SMDA/SMDR and press ENTER.
3. From the SMDA/SMDR menu, select automatic reports and press ENTER.
4. Type row number to select desired report and press ENTER.
5. Press SPACE bar for desired setting or type report print time in 24-hour format (as directed by menu prompt) and press ENTER.
6. Repeat steps 4 and 5 for all desired reports and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

SMDA Report Examples

Station Report for Extension - 125 (Savanah)

Date: 09/13/94 Time: 06:30

DATE	TIME	STATION	ACCOUNT	LNGTH	HOLD	I/O	RING	LINE	NUMBER
09/12	09:06	125		4.2	0.0	I	0.1	26	9737100
09/12	09:21	125		5.1	5.0	I	1.1	77	
09/12	09:45	125		1.1	0.0	I	0.0	26	
09/12	10:16	125		1.2	0.4	I	0.1	26	
09/12	15:01	125		8.3	8.2	I	0.8	74	
09/12	16:35	125		1.2	0.0	I	0.1	26	
09/12	16:39	125		1.2	0.0	O		73	9782200
09/12	16:40	125		0.4	0.0	O		73	9782200
09/12	16:49	125		0.3	0.0	I	0.1	26	
TOTALS:				23.0	13.6		2.3		
AVERAGE OUTGOING:				0.8	0.0			TOTAL OUTGOING:	2
AVERAGE INCOMING:				3.0	1.9		0.3	TOTAL INCOMING:	7
								TOTAL CALLS:	9

screen2.eps

Account Report for Account Number - 179059

Date: 09/13/94 Time: 06:34

DATE	TIME	STATION	ACCOUNT	LNGTH	HOLD	I/O	RING	LINE	NUMBER
09/12	08:59	159	179059	1.7	0.0	O		102	91234567
09/12	10:16	159	179059	8.5	0.1	O		102	91234567
09/12	11:02	159	179059	1.8	0.0	O		103	91234567
09/12	11:32	159	179059	2.5	1.2	I	0.0	17	
09/12	11:43	159	179059	4.2	0.0	O		102	91234567
09/12	12:05	159	179059	1.0	0.0	O		103	91234567
09/12	14:33	159	179059	1.2	0.0	O		102	91234567
09/12	14:40	159	179059	0.7	0.0	O		105	91234567
09/12	16:21	159	179059	1.0	0.0	O		103	91234567
09/12	17:06	159	179059	1.0	0.0	O		105	91234567
09/12	17:44	159	179059	0.1	0.0	O		103	91234567
TOTALS:				23.7	1.3		0.0		
AVERAGE OUTGOING:				2.1	0.0			TOTAL OUTGOING:	10
AVERAGE INCOMING:				2.5	1.2		0.0	TOTAL INCOMING:	1
								TOTAL CALLS:	11

screen3.eps

Detail Report for Line - 8 (L008)

Date: 09/13/94 Time: 06:40

DATE	TIME	STATION	ACCOUNT	LNGTH	HOLD	I/O	RING	LINE	NUMBER
09/12	08:25	141		33.2	19.9	I	0.0	8	
09/12	09:05	134		23.4	15.5	I	0.0	8	
09/12	09:29	185		0.1	0.0	I	0.1	8	
09/12	09:34	135		8.4	2.3	I	0.0	8	
09/12	09:44	134		13.1	1.9	I	0.1	8	
09/12	10:01	134		11.5	4.1	I	0.0	8	
09/12	10:13	134		14.6	6.7	I	0.0	8	
09/12	10:28	185		1.6	0.0	I	0.1	8	
09/12	10:30	140		6.9	3.2	I	0.1	8	
09/12	10:37	135		15.9	8.6	I	0.1	8	
09/12	10:54	133		13.5	2.1	I	0.0	8	
09/12	18:32	132		30.5	15.5	I	0.2	8	
09/12	19:02	140		13.5	9.6	I	0.1	8	
09/12	19:22	140		12.9	0.6	I	0.0	8	
TOTALS:				595.0	277.4		2.4		
AVERAGE OUTGOING:				0.0	0.0			TOTAL OUTGOING:	0
AVERAGE INCOMING:				11.2	5.2		0.0	TOTAL INCOMING:	53
								TOTAL NO ANSWER:	0
								TOTAL CALLS:	53

screen4.eps

Line Summary Report

Date: 09/13/94 Time: 06:44

LINE	CALLS	MINUTES	INCOMING	NOANS	OUTGOING	HOLD	PEAK HR	PK CAL	PK DUR
1	50	595.5	50	0	0	141.6	12 PM	8	45.8
2	41	565.3	40	1	0	183.2	2 PM	7	62.5
5	56	480.4	55	1	0	229.7	2 PM	13	75.7
6	38	387.0	38	0	0	129.0	12 PM	7	55.0
7	63	593.5	62	1	0	265.8	1 PM	8	58.0
8	53	595.0	53	0	0	277.4	11 AM	8	74.7
9	55	560.5	54	1	0	275.2	12 PM	8	55.2
10	53	512.8	53	0	0	243.7	4 PM	7	49.2
11	16	23.9	0	0	16	0.0	4 PM	4	9.3
12	5	11.8	0	0	5	0.0	2 PM	3	5.1
13	38	457.4	38	0	0	194.6	10 AM	6	40.2
14	31	323.4	31	0	0	153.9	4 PM	5	50.8
15	18	242.7	18	0	0	85.2	3 PM	4	81.1
16	164	489.5	159	5	0	108.2	10 AM	21	37.5
105	89	206.6	17	0	72	5.7	2 PM	17	22.6
106	41	98.6	0	0	41	3.6	3 PM	8	23.6
107	26	47.7	2	0	24	0.4	4 PM	7	11.2
109	36	57.9	17	2	17	0.0	10 AM	15	21.4
110	57	70.3	14	0	43	0.0	8 AM	17	20.7
111	36	113.0	34	2	0	6.1	4 PM	5	24.0
112	131	55.6	20	111	0	11.1	4 PM	38	0.3
TOT:	2886	11163.3	1547	154	1185	2913.1			

screen5.eps

LINE GROUP SUMMARY

LINE GROUP	ACCESSES	FAILURES
1	731	12
4	8	0
5	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0

screen6.eps

10.3 Account Codes *(Forced, with Positive Verification)*

10.3.1 Account Code (System Parameters)

Description: Account codes are used to identify calls by category or by any other desired grouping, so that the system can record costing by that category. You can arrange the system to force the user to enter an account code and have the system verify it before it allows the user to make a call. Turn on the account code feature for the entire system using this procedure. Also, enable or disable system verification of the entered code. If you enable verification, the system compares the account code entered by a station user with the programmed account code entries that you have assigned. If the system does not find a match and you have enabled the forced account code feature through station class of service, the system prevents any further dialing until the user enters a matching account code. If you have not enabled verification, the system does not check the entered account code for a match.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for desired value.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.3.2 Account Code Display And Account Code Display Time

Description: As a feature to LCD speakerphone users, a message appears in the telephone's display to prompt the user to enter an account code during incoming and outgoing calls. If the system does not require such a prompt (for example, because the account code feature is disabled), turn off the prompting message display with this programming operation. If the system does require the prompting display and you enable it using this procedure, also set the length of time that the prompt shows on the user's display.

NOTE: When the account code display is on, the user must enter an account code within the display time when he or she is making an outgoing call; otherwise, the system will drop the line.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR menu and press ENTER.
3. From SMDA/SMDR menu select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Press SPACE BAR for feature value.
6. When finished, press ESCAPE once.
7. If you enabled the display, continue with step 8. If you disabled the display, press ESCAPE once and continue with step 11.
8. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
9. Press SPACE BAR for time.
10. When finished, press ESCAPE twice.
11. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.3.3 Account Code Length

Description: An account code can be a minimum of three digits or a maximum of 16 digits. Use this procedure to set the amount of account code digits.

NOTE: If you change the account code length you will delete all currently programmed account codes.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press.
3. From SMDA/SMDR menu, select SMDA/SMDR parameters and press ENTER.
4. From SMDA/SMDR parameters menu, type item number for feature and press ENTER.
5. Type the account digit amount (3–16).
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.3.4 Account Code Programming *(Add, Remove, Display Account Codes)*

Description: Use this procedure to assign up to 1000 account codes (each up to 16 digits in length—see Section 10.3.3, *Account Code Length*). Alternately, use this procedure to remove previously assigned account codes from the system. Add or remove one account code at a time or an entire block of account codes all at once. To assign numbers that user's can dial without entering an account code, refer to Section 10.4, *Emergency Numbers.*

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR menu, select account code menu and press ENTER.
4. From account code menu, type item number to add or remove one account code or a block of account codes and press ENTER.
5. Type account code (up to 16 digits) and press ENTER. Then, if assigning block of codes, type quantity of account codes (up 1000) and press ENTER
6. When finished, press ESCAPE once.
7. Type item number to display account codes for review and press ENTER.
8. When finished press ESCAPE as necessary to return to main menu.

10.3.5 Account Code *(For Class Of Service)*

Description: After you have enabled the account code feature for the system, set its parameters, and programmed its list of account codes into the system, turn the feature on for a station class of service and make it either forced or optional. If you make it a forced account code, the user must enter an account code before the system will let him or her dial the number for an outgoing call. Also, on incoming calls a user must enter an account code before the system will allow him or her to make any future outgoing calls. See Section 10.4, , for an exception to forced account code entry.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for account code and press ENTER.
6. Press SPACE BAR for feature setting.
7. When finished, press ESCAPE.
8. Press CONTROL N as necessary to display line number for forced account code and press ENTER.
9. Type item number for forced account code and press ENTER.
10. Press SPACE BAR for feature setting.
11. When finished, press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

10.4 Emergency Numbers

Description: When the system requires an account code, a telephone user must enter it before the system allows him or her to dial a number; however, the system does not require an account code prior to allowing a telephone user to dial a designated emergency number. Use this procedure to list the designated emergency numbers. The system accepts a total of 16 numbers. Each number can be up to 16 digits long.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR menu, select emergency numbers and press ENTER.
4. From emergency numbers menu, type row number to select entry location and press ENTER.
5. Type emergency number (up to 16 digits), or press SPACE BAR to delete current number, and press ENTER.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Press ESCAPE to end.

10.5 Authorization Code

Description: Authorization codes provide system users the mobility to use their class of service (COS) features, prime line assignments, and exception numbers on any telephone in the system instead of being limited by what is available to the particular telephone they happen to be using. One popular term for such a feature is *walking class of service*.

Authorization codes are associated with personal intercom numbers as are COS, prime markings, and exception numbers. Therefore, when a user enters his or her authorization code at any system telephone, the code alerts the system as to what features to make available to the user. The user can employ the telephone for anything allowed by his or her personal intercom number; however, he or she cannot disturb the last number redial stored there by the normal user. Once an authorization code user accesses his or her telephone features, they remain in effect until any idle time at the telephone exceeds the authorization code time-out period.

As an additional feature, when a telephone is mapped with a lock button, a user can press it and then dial an authorization code. This action denies access to that telephone by other users. Use the procedure given here to program and assign authorization codes. Use the Section 7.2.3, *Class Of Service,* procedure to match the COS to the personal intercom number and use the Section 7.3, *Square/Nonsquare System–Button Mapping By Station*, procedure to assign the lock button to a telephone.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select SMDA/SMDR and press ENTER.
3. From SMDA/SMDR menu, type item number for authorization codes and press ENTER.
4. From authorization code menu, type line number to add, remove, or modify authorization codes and press ENTER.
5. Type authorization code (up to 6 digits) and press ENTER.

NOTE: You can include a two second pause as part of the authorization code by typing a p at the point in the code where you wish a pause to occur. If you include a pause, a user must wait two seconds at the proper point when he or she dials the authorization code because the pause is now part of the code.

6. If adding or modifying a code, type personal intercom number that it is to be associated with and press ENTER
7. When finished, press ESCAPE once.
8. Type item number to display authorization codes for review and press ENTER.
9. When finished press ESCAPE as necessary to return to system menu.

10.5.1 Authorization Code Timeout

Description: Once a user uses the authorization code feature to access his or her telephone features, they remain in effect until any idle time at the telephone exceeds the authorization code time-out period that you program with this feature.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

11 Programming Toll Restriction

- Toll Restriction Example 1 . . . . . 11.1
- Toll Rrestriction Example 2 . . . . . 11.2
- Toll Restriction Flow Diagram 11.3
- Restriction Level Programming 11.4
- Toll Groups Programming 11.5
- Restricted Numbers Programming 11.6
- Exception Number Programming 11.7

With the toll restriction feature, the system allows or denies outgoing line calls to selected users over selected lines. Toll restriction meets different dialing needs by allowing users to dial numbers that they are required to dial yet restrict them from dialing numbers they are not allowed to dial. A defaulted system allows station users to dial any number they choose to dial. When programming the various aspects of toll restriction, use the planning sheets provided in IMI66-110, *Programming Records For The DXP Digital Communications System*. The dialing option table provides for not only toll restriction but also automatic route selection and call costing features. Each of these features may be used separately, together, or not used at all. For a overview illustration of toll restriction, refer *Section 11.3* Assign toll restriction in the sequence detailed below.

Step 1. Program the restriction level (Section 11.4). Step 2. Program the toll groups (Section 11.5).
Step 3. Program the restriction numbers (Section 11.6). Step 4. Program the exception numbers (Section 11.7).

A user can dial any number that his or her station is not restricted from dialing. A station user can dial any numbers restricted by a restriction level that is equal to or lower than the one assigned to his or her station. A station that is restricted from dialing a certain telephone number on a certain line can, if programming permits, dial that number on another line that is not restricted.

As a user dials a number from a station that has toll restriction assigned, the toll restriction feature first makes a comparison between the dialed number and the telephone number entries on the toll restriction table. It compares the dialed number up to the last digit in the entry. At that point it considers it a match and applies the other restriction tests whether the station user keeps dialing or not.

Example entry A: 1-804 555-1212
Example entry B: 1-804
In example A, the toll restriction feature continues matching digits (and does not apply any restriction) until the the user dials the entire 11-digit number.
In example B, the feature applies restriction after the user dials 1-804.

If the feature finds a match in the toll restriction table, it next compares the dialed number to entries in the toll group. If it finds a match here, it next compares the restriction level of the entry against the restriction level of the station. If the restriction level of the station is equal to or less than the restriction level of the matched entry, the toll restriction feature allows dialing over the line specified with the toll group assignment. If the restriction level is greater than the restriction level of the matched entry, the toll restriction feature compares the dialed number to the exception number list. If it finds a match there, it allows the call.

11.1 Toll Restriction Example 1

In this example, the chief executive can dial all telephone numbers except those numbers with a restriction level of always deny. The section manager can dial all numbers except those in restriction level 8 (international numbers over lines assigned to toll group 1) and those numbers with a restriction level of always deny. The unit manager can dial all numbers except those numbers in restriction levels 7 and 8 (international numbers over lines assigned to toll groups 16 and 17) and those numbers with a restriction level of always deny. All other users can dial all numbers except those in restriction levels 6 (local calls over lines assigned to toll group 5), 7 (out of state numbers over lines assigned to toll groups 16 and 17), 8 (international numbers over lines assigned to toll group 1) and those numbers with a restriction level of always deny. All toll restricted stations can dial 1800 numbers on all lines. No toll restricted station can dial 1900 numbers on any line. Note that the feature allows dialing on lines that are not in the toll group. As illustrated in this example, there is no restriction for international dialing on lines in toll groups 2, 5, 16, and 17 and there is restriction only on lines 1–5 in toll group 1.

Toll Category	Dialing	Restriction Level	Toll Group
Chief Executive	International 011	8	1,
Section managers	Out of state	7	16, 17
Unit managers	In state	6	5
All other users	Local calls	1	2
911	Always allow	32	
1800	Always allow	32	
1900	Always deny	32	

Toll Group	Lines Assigned
1	1, 2, 3, 4, 5
2	6, 7
5	12, 13
16	14, 15
17	20, 25, 26, 27, 28, 29, 30
32	All Lines

11.2 Toll Restriction Example 2

In this example, assume that you have assigned the following restriction levels and exception numbers to the following people in a company: Keep in mind that you assign restriction level to stations by programming the class of service with a particular restriction level while you assign exception numbers to individual stations through station programming.

Station	Restriction Level	Exception Number
President	8	NONE
Executive	7	NONE
Manager	6	NONE
Joe in sales	1	5
Sally in sales	1	5, 6

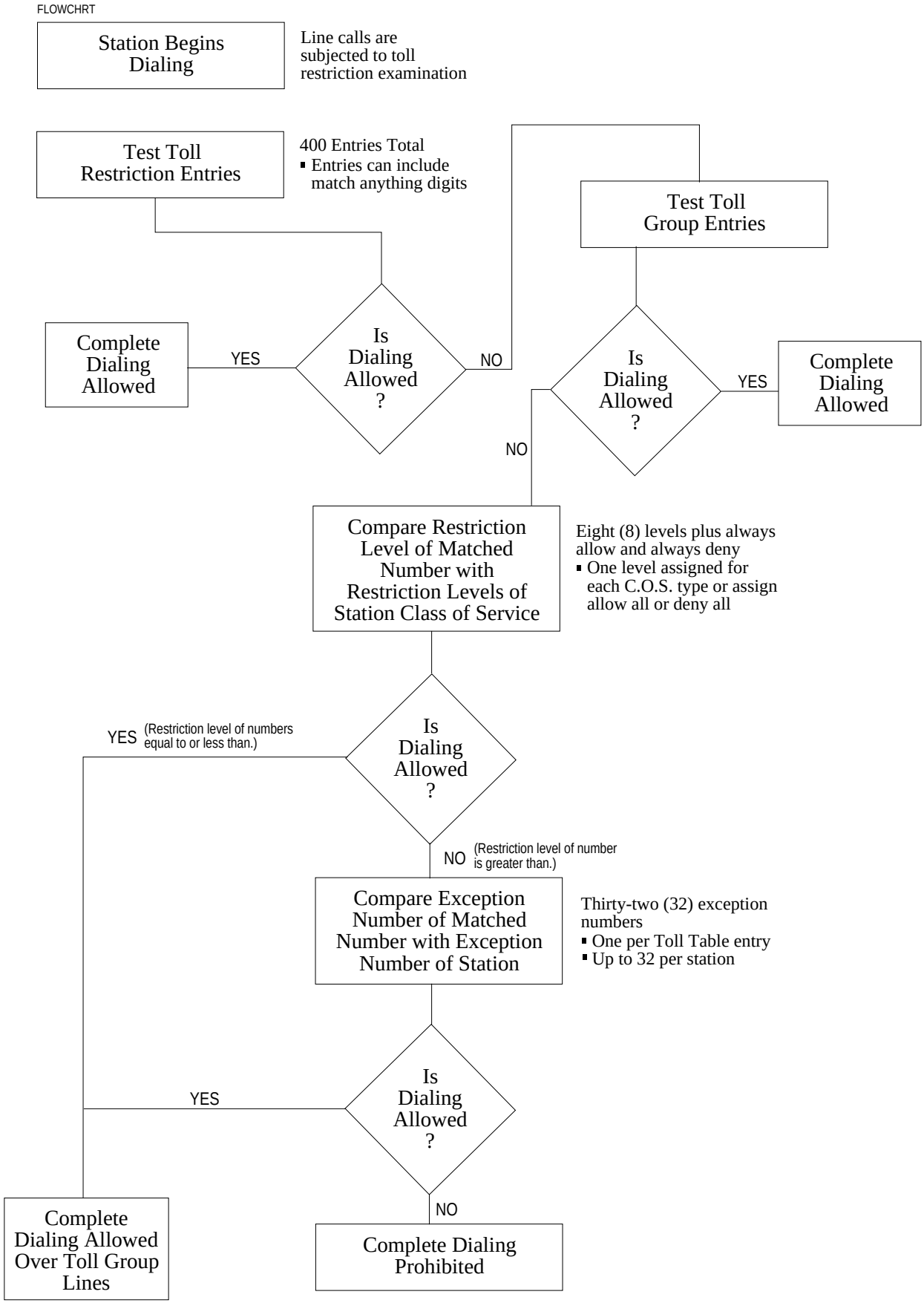
Also, assume that you have programmed the following outside numbers, restriction levels and exception numbers into the toll restriction table:

Number	Restriction Level	Exception Number
1212	7	5
1213@@@@@@@	6	6
978	2	NONE
911	ALWAYS ALLOW	NONE

A toll restriction arrangement such as this example permits the following dialing conditions:
the president and the executive can dial all numbers,
the executive can dial any 1–212 prefixed number, any 1-213 prefixed number (remember, @ = match any digit), 978 numbers, and 911 (any numbers with restriction level equal to or less than 7),
the manager can dial any 1-213 prefixed numbers, 978 numbers and 911 (any numbers with restriction levels equal to or less than 6),
Joe (in sales) can dial 911 (via his restriction level) plus 1-212 numbers through his exception number,
Sally (in sales) can dial 911 (via her restriction level) plus 1-212 and 1-213 numbers through her exception numbers.

(Remember, exception numbers allow Joe and Sally to dial numbers that are denied to them through their restriction levels.)

11.3 Toll Restriction Flow Diagram


FLOWCHRT
Station Begins Dialing
Line calls are subjected to toll restriction examination
Test Toll Restriction Entries
400 Entries Total
▪ Entries can include match anything digits
Test Toll Group Entries
Complete Dialing Allowed
YES
Is Dialing Allowed ?
NO
Is Dialing Allowed ?
YES
Complete Dialing Allowed
NO
Compare Restriction Level of Matched Number with Restriction Levels of Station Class of Service
Eight (8) levels plus always allow and always deny
▪ One level assigned for each C.O.S. type or assign allow all or deny all
YES (Restriction level of numbers equal to or less than.)
Is Dialing Allowed ?
NO (Restriction level of number is greater than.)
Compare Exception Number of Matched Number with Exception Number of Station
Thirty-two (32) exception numbers
▪ One per Toll Table entry
▪ Up to 32 per station
YES
Is Dialing Allowed ?
NO
Complete Dialing Allowed Over Toll Group Lines
Complete Dialing Prohibited

11.4 Restriction Level Programming

Description: Group the system stations into as many as eight different toll calling categories based on the freedom to dial various numbers or the restriction from dialing them. Assign one of eight different restriction (1–8) levels or assign an "allow all" level or a "deny all" level. Level 8 is the least restrictive from a station viewpoint but the most restrictive from a restriction table viewpoint. (For example, a station with a restriction of 8 is only restricted from dialing "always deny" numbers and it can dial numbers with restriction levels of 1–8. A station with a restriction level of 1–7 cannot dial a number with a toll restriction table entry of 8.) The "allow all" entry ensures that the system applies no dialing restriction to a number (example: 911). The "deny all" ensures that a station user can never dial a number (example: 1-900).
You actually assign a restriction level to a station by first assigning it to a station class of service and then assigning that class of service to the station. As previously described, the class of service assignment provides features and service that matches the needs of a specific category of stations. Program the restriction level value that accurately reflects the toll restriction dialing freedom expected by a specific category of stations.

Programming: Refer to IMI66-110, *Programming Records,*and locate the toll restriction programming record–station restriction level work sheet . Use this work sheet to create eight station categories. Order these categories from those with the most dialing freedom to those with the least and then note the station ports that you plan to each category. Arrange the toll restriction numbers into these categories so that they correspond to the required dialing freedoms. Assign restriction level numbers to each category. Also, list those numbers that every station must be allowed to dial (such as 911) as "always allow" and list those numbers that should never be dialed, (such as 1-900) as "always deny".

1. From main menu, select TOLL/ARS and press ENTER.
2. From toll restriction menu, select restriction tables and press ENTER.
3. From toll restriction level menu, type 1 and press ENTER.
4. Select entry line for programming and press ENTER.
5. Press TAB to position cursor to restriction level column.
6. Press SPACE BAR to select restriction level 1–8, allow all, or deny all.
7. Press ENTER and repeat step 7 for each entry line.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ENTER to end.

Assign restriction level to class of service with this procedure.

1. Use the work sheet to note the class of service for each restriction level entry.
2. Press CONTROL T for main menu.
3. From main menu, select stations and press ENTER.
4. From stations menu, select COS programming and press ENTER.
5. From COS programming, type class of service number (1–32) ENTER.
6. From COS programming menu, type item number for day/night restriction level and press ENTER.
7. Type restriction level number (1–8).
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE to end.

11.5 Toll Groups Programming

Description: You must assign the individual lines, that you do not want users to use when they dial toll restricted numbers. Do this by first assigning the lines to toll groups and then assigning those toll groups to the restricted number. There are 32 toll groups available for line assignment. Assign one, several, or all lines to any desired toll group or combination of toll groups as needed.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line name or line number and press ENTER.
5. From line programming, type item number for toll groups and press ENTER.
6. Type group number (0–32) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

11.6 Restricted Numbers Programming

Description: Program restricted numbers as entries in the toll restriction table. The system will accept up to 400 entries. Each restricted number can be up to 16 digits long and can be comprised of the digits 0—9 plus the "match any" digit (@) if needed.

If you program the system to include the automatic route selection (ARS) feature, always fill out the restricted numbers with the @ digit as shown in the following examples:
for 1+ dialing, enter 1@@@@@@@@@@,
for local dialing, enter @@@@@@@,
for 1+ 7-digit dialing, enter valid exchanges and the @ digit—either enter 1555@@@@ or enter 555@@@@ with the 1 added by the ARS modify digit table.

When you make this arrangement, you ensure that ARS will wait until the user dials all the number's digits before it determines if all routes are busy. This eliminates the possibility of the user accidentally dialing an intercom number or a feature code.

You can enter a pause at the end of a restricted number's digit string to indicate that dialing is complete. Do this by typing a P or p after you type the digit string. The pause entry distinguishes this restricted number as unique. You can enter the same digits without the pause but instead followed by additional digits as another unique number. You can assign different routing and toll restriction parameters to each of these entries. There are several applications for this feature. One application is in international dialing where different toll restriction parameters apply depending upon whether the caller dialed 0 or 011. In this case, you can enter 0 **pause** to access local lines and 01 to access international lines. Another application is with tie line calling where a remote extension is the same digits as an office or area code that you need to enter in the restriction table. By entering nnn **pause** for tie line access and nnn@ for CO line access, the system can route the call over the proper line. A third application is brought forth with the advent of the new North American Numbering Plan (NANP). With NANP, an area code may be the same digits as a local office code. You can enter nnn@@@@ **pause** for local line access and nnn@@@@@@@ for long distance line access. In any application, the system resets its pause timer after receiving each caller dialed digit. If the timer expires before the caller dials another digit, the system routes the call based on the digits preceding the **pause**. If, instead, the system detects more digits instead of a **pause**, it routes the call based on the entire digit string.

You can enable the pause entry ability using the Section 6.10.5, *Toll/ARS Dialing Pause,* programming procedure; however, the following Section 11.6.1, *Restricted Number Programming Procedure,* procedure for entering the restriction number digits also includes the pause enabling procedure.

11.6.1 Restricted Numbers Programming Procedure

Programming: Refer to IMI66-110, *Programming Records,*and locate the *toll restriction programming record–dialing option table* Use this table to make a list of all of the restricted numbers that the site requires. Include numbers on the list that should never be restricted, such as 911 (exception). Also include numbers that should never be dialed, such as 1-900 (always deny). Use the @ "match any" symbol to encompass a range of numbers wherever possible, such as 1@@ for any number beginning with a 1. You can enter up to 400 line items on this table.

To enable pause entry,

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, select toll/ARS dialing pause and press ENTER.
5. Press SPACE bar for feature setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

To enter restriction number digits,

1. Press CONTROL T for main menu.
2. From main menu, select TOLL/ARS and press ENTER.
3. From Toll/ARS menu, select restriction tables and press ENTER.
4. From toll restriction table menu, select entry line for programming and press ENTER.
5. Type restriction number entry and press ENTER
   (Entry can be 16 digits long and can include @ as match any symbol and P for pause.)
6. Repeat steps 5 and 6 for all entries.
7. When finished, press ESCAPE twice.
8 Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

11.7 Exception Number Programming

Description: Exception numbers allow stations to dial numbers that are not normally allowed by their restriction levels. When a user dials a number at his or her station, the toll restriction feature compares it to the toll restriction numbers, the toll groups, the restriction level, and to the exception number. If the feature makes a match, the station is not normally allowed to dial the number. However, if the exception number of the toll restriction table line entry matches one of the exception numbers assigned to the station, the feature allows the station to dial the number. The exception number values that you can assign are 1 through 32 and NONE. You can assign 32 exception numbers to each station. You can assign one exception number to each toll restriction table line entry. The feature provide you with separate line entries expressly for the purpose of specifying special dialing exceptions.

Programming: Assign exception number to toll restriction table line entry with this procedure.

1. Assign an exception number of 0 to 32 to each listed restriction number that may need it.
2. Press CONTROL T for main menu.
3. From main menu, select TOLL/ARS and press ENTER.
4. From toll restriction menu, select restriction tables and press ENTER.
5. From the restriction table menu, type row number and press ENTER.
6. Press TAB to position cursor to exception level column.
7. Type exception number 0–32.
8. Press ENTER and repeat step 7 for each line entry.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Assign exception number to station with this procedure.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type intercom number or name of station.
5. From station programming menu, type item number for Day (or Night) exception number.
6. Type exception numbers 0–32 (n,nn or n–nn) or type 0 for none.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

12 Enabling Automatic Route Selection

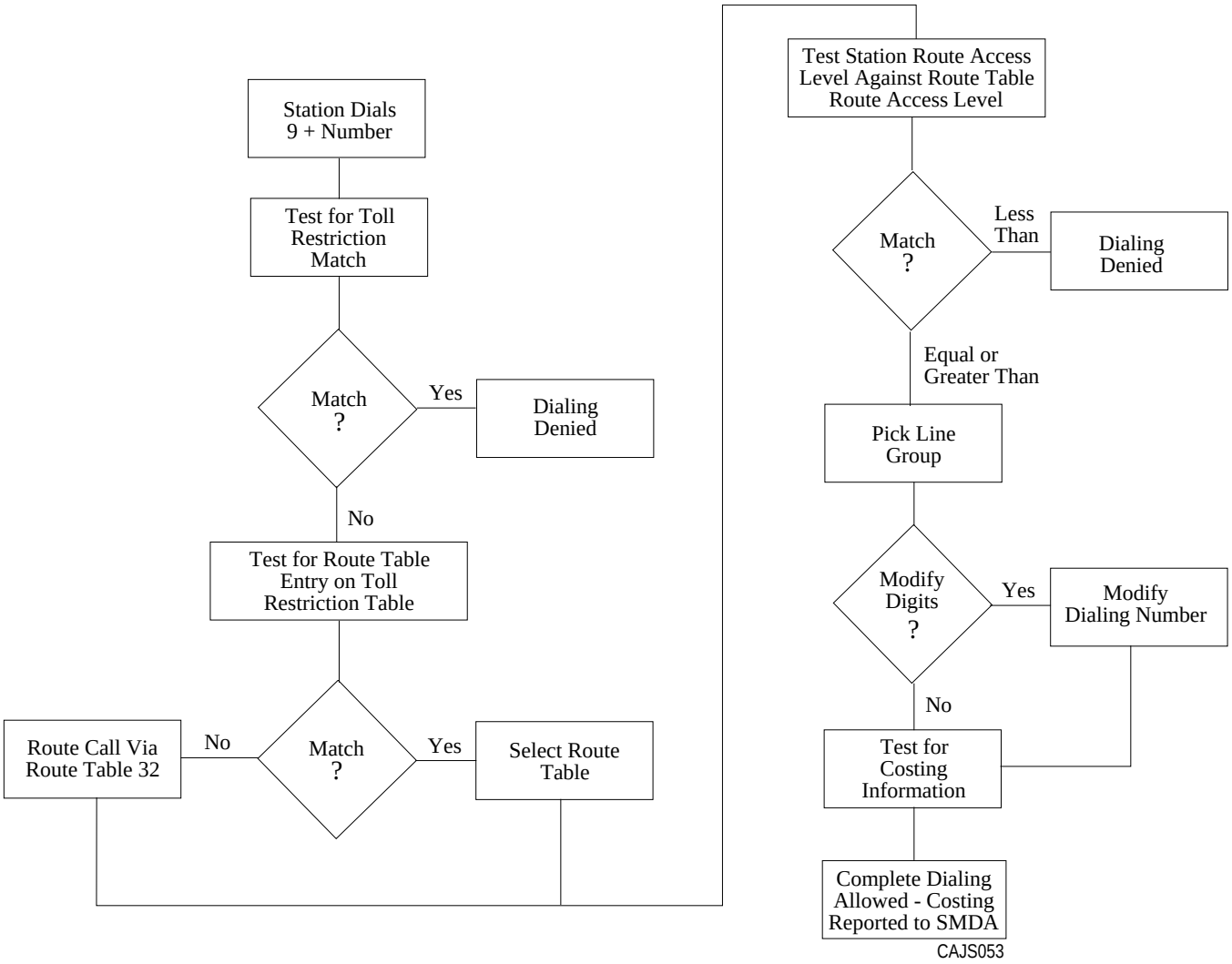
- Automatic Route Selection Diagram 12.1
- ARS Enable 12.2
- Line Groups for ARS 12.3
- Route Tables (ARS 12.4
- Costing Information (ARS) 12.5
- Automatic Route Selection for Speed Dial Numbers 12.6

Automatic route selection (ARS) permits the system to select the least costly line group that is available to a station to route its outgoing call over. The system modifies the dialed number, if needed, to match the selected line group. Additionally, ARS provides the costing information for the dialed call that is reported by the station message detail accounting feature. ARS makes its routing decisions (which lines to route a call over, when and how to modify a number, and costing information) based entirely upon the programming of the system.

NOTE: When the ARS feature is active, never program a direct line appearance to a station. If a station user selects a line directly at his or her station, the system will not route the call using the ARS feature.

For an overview of automatic route selection, refer to Section 12.1, *Automatic Route Selection Diagram*.

12.1 Automatic Route Selection Diagram



12.2 ARS Enable

Description: You can enable or disable automatic route selection on a system-wide basis. A defaulted system has ARS disabled.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From the system menu, select system parameters and press ENTER.
4. From the system parameters menu, select ARS feature and press ENTER.
5. Press SPACE BAR to toggle between enable and disable.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

12.3 Line Groups for ARS

Description: Before automatic route selection can operate, you must group similar lines together into line groups. The system can have a total of 16 line groups with unlimited lines in each group.
Be sure that you program similar line types together into the same line groups to take advantage of the efficiency and cost savings associated with automatic route selection. Some examples of lines that have similar characteristics and should be grouped together into line groups are as listed below:
–outgoing WATS lines to a particular area,
–FX lines to a frequently called area,
–similar AT&T long distance lines,
–similar MCI lines,

A line group can consist of only one line, (for example, if only one FX line exists, put it into a separate line group). Doing this allows the ARS feature to route calls over that group (FX line) for any calls to the FX line area.

NOTE: To prevent system users from accessing non-ARS line groups, use the Section 6.13, Feature Renumbering, *procedure to clear the dialing codes for all non-ARS line groups.*

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From the lines menu, select line group programming and press ENTER.
4. Type line group number (1–16) and press ENTER.
5. Type a to add lines, r to remove lines, or c to change name of line group and press ENTER.
6. Type line to be removed, added, or changed then press ENTER.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 4–7 for each line port or press ESCAPE to end.

12.4 Route Tables (ARS)

Description: The ARS feature interacts with the toll restriction feature. You must enter a number into the toll restriction table and assign a route table (1–32) to it before the system can perform ARS on the dialed number. The system will route only those numbers that you have both assigned a route number and entered on the toll restriction table.

The route table entry specifies the following parameters:

- over what line group the call will route,
- whether the station is permitted to make a call on that group,
- whether the dialed numbers must be modified to match that line group.

If a dialed number is not matched by an entry in the toll restriction table, it is routed by route table 32—the default route table. The system defaults table 32 to use line group 16 and it defaults line group 16 to use all lines. You must either remove all invalid lines from line group 16 or make table 32 inactive if you do not need default routing.

The entered numbers can be some of the same numbers that you enter as toll restriction numbers or other numbers that are in addition to them. Either way, you can enter a maximum of 400 toll restriction and/or ARS numbers. Each entered number can be up to 16 digits long and can be comprised of digits 0–9 plus the "match any" digit (@) if needed.

NOTE: When the system accepts a number entry into the toll restriction table, it re-orders all of the table entries. The system places a 0 after all other digits in the entries. Also, it places a number with a leading 1 ahead of the same number without a leading 1.

Programming: To enter a number in the toll restriction table and assign a route table to it, proceed as follows,

1. Make a list of the numbers to be routed.
2. Press CONTROL T for main menu.
3. From main menu, select TOLL/ARS and press ENTER.
4. From the toll restriction menu, select restriction tables and press ENTER.
5. Select line number and press ENTER. (Press CONTROL and type N for additional page of line numbers).
6. Type ARS number entry. Entry can be up to 16 digits long and can include @ as "match any" symbol.
7. Press TAB key to place cursor at route table entry column.
8. Type 1–32 to choose route table and press ENTER.
9. Repeat steps 5–8 for all required ARS numbers.
10. When finished, press ESCAPE twice.
11. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

12.4.1 Route Table Warning Tone

Description: You can arrange for the system to sound a warning tone in the user's handset or station speaker if ARS routes a call on any route other than the least expensive, This tone indicates that the system has chosen a more expensive line group. If a station user hears this tone, he or she should hang up and try again later.

Programming: To enable route select warning tone,

1. Press CONTROL T for main menu.
2. From the main menu, select TOLL/ARS and press ENTER.
3. From the TOLL/ARS menu, select route table and press ENTER.
4. Type 1–32 to select route table to be programmed and press ENTER.
5. Type 1–6 to select route number and press ENTER.
7. Press TAB key to position cursor at route status column.
8. Press SPACE BAR for feature value and press ENTER.
9. Press ESCAPE.
10. Repeat steps 5 through 9 for all six routes.
11. When finished, press ESCAPE.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
13. Repeat steps 4–12 for all route tables.
14. Press ESCAPE twice to return to main menu.

12.4.2 Routes

Description: There are a total of 32 route tables that you can be program for the system. Each route table can contain up to 6 routes. Each of these routes convey the data listed as follows:
–the line group to route the call over, –the access level of the route,
–the modify digit table, –all costing information.

Program the six routes from the least costly routing method to the most costly routing method. The cost of the route is determined by the line group over which the call is routed. ARS will always try to select route 1 first, and then 2 through 6, when routing a call. If a station, through its class of service assignment, does not have a route access level high enough to allow it access the route selected by ARS, dialing is denied. If the route access level is high enough, ARS will route the call based on the routing information. If the system cannot route the call over the line group that ARS first selects, ARS will try the next route of the route table. Once again the route access level is tested. This process is repeated, up to a maximum of 6 times. If the station has access to at least the first route, but is unable to dial out (because all lines are busy), it will receive a busy tone in the handset or speaker. The station can then camp-on the route so it will ring when a line in the route table becomes available.

Programming: Assign line groups to routes as follows,

1. Form lines and program them as described Section 8.2, *Line Group Programming*. On a work sheet, note the line group for each route.
2. Press CONTROL T for main menu.
3. From the main menu, select TOLL/ARS and press ENTER.
4. From TOLL/ARS menu, select route tables and press ENTER.
5. Type 1–32 to select route table to be programmed and press ENTER.
6. Type 1–6 to select route and press ENTER.
7. Type 1–16 to choose line and press ENTER.
8. Press ESCAPE and repeat steps 6–8 for all six routes.
10. Press ESCAPE twice.
11. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
12. Repeat steps 5–11 for all 32 tables and press ENTER.
13. Press ESCAPE twice to return to main menu.

12.4.3 Route Access Level

Description: Each of the six routes of a route table require a route access level of 1 to 4. ARS uses this route access level to determine if the dialing station has access to dial out on the route. Each station, through its class of service, is also assigned a route access level of 1 to 4. Before the system accepts a dialed number, ARS compares the route access level entries. If the station route access level is greater than or equal to the route access level assigned to the route, the station is allowed to access the route. Otherwise, the system will not accept the dialed number, and sounds an error at the station's speaker or handset. The route access level allows some stations to gain access to the more costly routes in a route table while denying it to others. Just as you program each route from least to most costly, you must also arrange the route access level to increase from a low level to a high level. This is necessary because once the system denies dialing because of the level, it will not try another route. The more costly the route is, the higher the access level needed to access it.

Programming: To program the access level for the route,

1. Press CONTROL T for main menu.
2. From the main menu, select TOLL/ARS and press ENTER.
3. From the TOLL/ARS menu, select route tables, press ENTER.
4. Type 1–32 to select route table to be programmed and press ENTER.
5. Type 1–6 to select route number and press ENTER.
6. Press TAB key to position cursor at route access column.
7. Type 1–4 to choose access level and press ENTER.
8. Press ESCAPE and repeat steps 5 through 8 for all six routes.
9. When finished, press ESCAPE.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Press ESCAPE twice to return to main menu.

To program the access level for the station class of service,

1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for day route access and press ENTER.
6. Press SPACE bar for feature setting.
7. Press ENTER for night route access level, and press SPACE bar for feature setting.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Repeat steps 4–8 for each COS or press ESCAPE to end.

12.4.4 Modify Digit Table

Description: Each of the six routes in each route table has a modify digit table. This modify digit table details any modifications that the system needs to do to the user dialed number. This need for modification is determined by the type of lines that you include in the line group for the route. If a line group requires that the dialed number be in a specific format, you must set up an appropriate modify digit table. You must program the index number of this table into the specifications of the route that the line group is found. The sole purpose of the index number and the corresponding table are to modify the number dialed by the station user.

Example
Assume that a station dials 1–202–222–3456 (Washington D.C. area). Also, assume that the system has an FX line for the Washington D.C. area and that this is the way that ARS is going to route the call. Finally, assume that the route table route contains a modify digit table index number that points to the following modify digit table:
ADD AMOUNT = 0
DIGITS TO ADD = n/a
DELETE AMOUNT = 4
This situation results in the system deleting 1-202 (DELETE AMOUNT = 4), from the beginning of the number and adding 0 digits (ADD AMOUNT = 0). This modification allows the number 222–3456 to be dialed over the FX line to Washington D.C.

There are 16 modify digit tables in the system. Each modify digit table contains the following information:
- numerical sequence of the digits to be added (valid digits are 0-9 and the pause ,*p*, digit) in a digit string that can be up to 20 digits long,
- number of digits to be deleted from the dialed number (this value can be from 0 to 10).

NOTE: When ARS modifies the dialed number, it first deletes from the beginning of the number and then adds to the beginning of the number.

Programming Modify Digit Tables

Description: Use this procedure to program the modify digit table.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select TOLL/ARS and press ENTER.
3. From the TOLL/ARS menu, select modify digit table and press ENTER.
4. Type line number for modify digit table to be programmed and press ENTER.
5. Press TAB key to position cursor at digits to delete column.
6. Type 0–10 for number of digits to delete.
7. Press TAB key to position cursor at digits to add column.
8. Type digits to add (0–9, pause). A maximum of 20 digits can be entered.
9. Press TAB key to position cursor for next modify digits table.
10. Repeat steps 6–9 until all modify tables are entered and press ENTER.
11. When finished, press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.
13. Press ESCAPE to return to main menu.

Assigning Modify Digit Table To Route

Description: Use this procedure to assign modify digit tables to routes.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select TOLL/ARS and press ENTER.
3. From the TOLL/ARS menu, select route table and press ENTER.
4. Type 1–32 to select route table to be programmed and press ENTER.
5. Type 1–6 to select route number and press ENTER.
6. Press TAB key to position cursor at modify table column.
7. Type 1–16 ENTER to choose modify digit table needed.
8. Press ESCAPE and repeat steps 5 through 8 for all six routes.
9. When finished, press ESCAPE .
10. Type y to accept entries, n to reject them, or r to resume editing and press ENTER.
12. Repeat steps 4–11 for all needed route tables or press ESCAPE to end.
13. Press ESCAPE twice to return to main menu.

12.5 Costing Information (ARS)

Description: Each route in every route table contains costing information. The costing information includes a surcharge, a first tier cost per minute, a second tier cost per minute, and the amount of time to cost the call at first tier cost before switching to the second tier cost. The surcharge is a dollars and cents value that the system adds to the total cost of a call. You can program both tier costs in one cent increments in the range of $0.0 through $99.99 per minute.
Even if the system does not route a call through ARS, (for example, when a station user direct selects a line), the system will still access the costing information to cost the call.
The system reports call costs as part of the SMDA report. Use Section 10.1 to set the SMDA costing parameters for this report.

Programming: To program call costing,

1. Press CONTROL T for main menu.
2. From the main menu, select TOLL/ARS and press ENTER.
3. From the TOLL/ARS menu, select route table and press ENTER.
4. Type 1-32 to select route table to be programmed and press ENTER.
5. Type 1-6 to select route number and press ENTER.
6. Press TAB key to position cursor at surcharge column.
7. Type dollar and cents value ($nn.nn) of the surcharge.
8. Press TAB key to position cursor to tier 1 cost column.
9. Type tier 1 cost ($nn.nn).
10. Press TAB key to position cursor to tier 1 time column.
11. Press SPACE BAR to select desired time.
12. Press TAB key to position cursor to tier 2 cost column.
13. Type tier 2 cost ($nn.nn).
14. Press ENTER to accept entries.
15. Press ESCAPE.
16. Repeat steps 5–15 for each route number. When finished, press ESCAPE.
17. Type y to accept entries, n to reject them, or r to resume editing and press ENTER.
18. Repeat steps 4–11 for each route table. When finished, press ESCAPE twice to return to main menu.

12.5.1 Call Cost Display (Display Of Costed Calls)

Description: If you have arranged for the system to employ call costing, you can use this procedure to arrange for an LCD speakerphone to display the cost of a call made from that station.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

12.5.2 Cost Incoming

Description: If you have arranged for the system to cost calls, you can arrange for it to also cost incoming calls on a per line basis. You can arrange for the costing to begin as soon as the call arrives in the system , begin after the user answers the call or begin after a programmed delay. Plus, you can pick the call rate table that you want the system to use when it costs the call.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming.
4. Type line port number (1-128) or name and press ENTER.
5. From the line programming menu, type item number for feature and press ENTER.
6. From cost incoming prompt, press SPACE bar for desired feature setting and press RETURN.
7. From incoming cost delay prompt, press SPACE bar for desired feature setting and press ENTER.
8. From incoming cost route prompt, type 1–32 for desired route table.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4-8 for each line port or press ESCAPE to end.

12.6 Automatic Route Selection for Speed Dial Numbers

Description: You can arrange for the system to process the system speed dial, and any personal speed dial numbers, that you program for the users, through the automatic route selection (ARS) feature. If the users program their own personal speed dial numbers and you have enabled ARS processing of calls, they must prefix their personal speed dial numbers with the ARS preselect code. Instruct them to follow the procedure given here when they do this. See Section 6.7, *Speed Dial Programming*, for speed dial programming.

Programming: To arrange for the system to process the system speed dial numbers through the ARS feature.

1. From system menu, select speed dial and press ENTER.
2. From speed dial menu, type item number for desired speed dial number and press ENTER.
3. Press TAB to place cursor in preselect column.
4. Press SPACE bar to choose ARS.
5. Press TAB to place cursor in number column.
6. Type system speed dial number (max. 32 digits, P = pause, F = hookflash) and press ENTER.
7. Repeat steps 5 through 8 for all desired system speed numbers.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end

To arrange for the system to process each station's personal speed dial numbers through the ARS feature.

1. From the stations menu, select button mapping and press ENTER.
2. Type personal intercom number or previously assigned name for first station to be programmed and press ENTER. Button map with current assignment appears on screen.
3. Type button code (L1–L25, 0–9) for button to be arranged for personal speed dial use and to be processed through ARS and press ENTER.
4. Type SDIAL and press ENTER.
   (This action arranges the button as a personal speed dial button).
5. Type *a* and press ENTER.
   (This action arranges for the speed dial number to be processed through the ARS).
6. Type the speed dial number (max. 16 digits) and press ENTER.
7. Repeat steps 3–6 for all desired personal speed dial numbers.
8. Press ESCAPE and repeat steps 4–9 for all desired stations.
9. When finished press ESCAPE to end.

Instruct station users to program personal speed dial numbers per the following sequence when you have enabled ARS call routing for their use:

1. Press INTERCOM,
2. Dial ✻ ✻ 1,
3. Press speed dial button,
4. Dial 9 for ARS (on LCD speakerphones, dial 9 when prompted to enter line),
5. Dial personal speed dial number (max. 16 digits, HOLD = pause, TAP = hookflash),
6. Press TRNS/CNF to store number,
7. Repeat steps 3–6 for next button or press SPEAKER to end programming.

13 Selecting System Printouts (Printer Interface)

Description: The system makes a wide variety of printout records available. Use this programming procedure to choose the user's desired printout types and to direct the printouts to either the SMDA/SMDR data printer or the VDT screen.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select printouts and press ENTER.
3. From printouts menu, select desired printout category and press ENTER.
4. Type s for screen printout or p for hard copy printout through the SMDA/SMDR data printer and press ENTER.

NOTE: Press CONTROL C to stop a printout to the VDT screen when necessary. This action will not stop printout to a data printer.

5. When printout is finished, press any key to return to category menu and repeat steps 4 and 5 for next desired printout or press ESCAPE to return to printouts menu.
6. Repeat steps 3–6 for next desired printout or press ESCAPE to end.

14 Programming For Peripheral Devices

- Caller ID Programming 14.1
- Tracker Paging System 14.2
- Digital Voice Announce Programming 14.3
- PC Attendant Position Programming 14.4
- Voice Mail Programming 14.5
- Modem Setup 14.6

14.1 Caller ID Programming

The DXP caller ID feature supports an externally connected, customer-supplied caller ID device (product code CID08). This hardware device supports eight caller ID conditioned lines, and the installer can serially connect up to eight devices to give the DXP the ability to support a maximum of 64 caller ID conditioned lines. The caller ID unit interfaces with the DXP through any main or auxiliary serial data port (Section 6.5). Any proprietary digital LCD speakerphone can receive and display caller ID information. The display conveys all available caller ID information from the time the call rings at the station, through all line transitions, until the line disconnects. The system stores caller ID information in its SMDA storage and makes it available in the SMDA printout.
In programming for caller ID support, you must match the data baud rate with that of the CID08, you must enable the caller ID lines, and you must assign them to ring on the telephones. You can set the caller ID options, and enter the local area codes and local exchange codes that you want the system to skip when it automatically dials a return call. You can also assign caller ID ring no-answer (RNA) capability to the telephones that are on caller ID lines. Users of these telephones have the ability to review this caller ID RNA information and return the call. They can also note if anyone else has already viewed a record thus preventing redundant returns.

14.1.1 Deleting Viewed RNA Record (for Caller ID)

Description: When the system makes caller ID RNA information available to a group of stations, any station user in the group can review the information by pressing the telephone's CID button. When he or she does this, the system removes the record from that telephone but continues to flash the CID button status light for other stations in the group. If you enable this feature, the system will remove the caller ID record from all telephones if any user in the group views a record.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select caller ID and press ENTER.
4. From caller ID menu, select options and press ENTER.
5. From the options menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

14.1.2 Setting Absorb Ring Time (for Caller ID)

Description: Use this procedure to specify the amount of time the system waits while it generates caller ID information before it generates system ringing.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select caller ID and press ENTER.
4. From caller ID menu, select options and press ENTER.
5. From the options menu, type item number for feature and press ENTER.
6. Press SPACE bar for time (0–8 seconds) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

14.1.3 Arranging Local Call Table (for Caller ID)

Description: When telephone users review caller ID RNA calls, they press their SAVE button to return the call, and the system automatically dials the number. If the area code or office code part of the stored number matches the entries that you program with this procedure, the system will skip that part of the number as it dials.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select caller ID and press ENTER.
4. From caller ID menu, select local call table and press ENTER .
5. From the local call table menu, enter area codes or office code and press ENTER.
6. Repeat step 4 for all desired codes (16 maximum)
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

14.1.4 Making Caller ID Active

Description: When caller identification (ID) information is available from the central office, take this programming action to match the line port to the feature. You must also assign the caller ID lines to the stations and assign special-purpose station buttons to control the feature.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select lines and press ENTER.
3. From the lines menu, select line programming and press ENTER.
4. Type line port number (1–128) or name and press ENTER.
5. From the line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4 through 8 for each line port or press ESCAPE to end.
10. Assign caller ID lines to stations—refer to Sections 7.1.32, *Line Answer*, and 7.1.33, *Line Originate* for details.
11. Assign caller ID button (mnemonic CID) and SAVE button (mnemonic SAVE) to stations—refer to Section 7.3, *Square/Nonsquare System–Button Mapping By Station*, for details

14.1.5 Setting Caller ID Baud Rate

Description: You must program the parameters of the main or auxiliary serial data port where the installer has connected the CID08 device. The serial data port parameters must match the data parameters of the CID08 device. Usually, this is 9600 baud, eight data bits, no parity bit, and one stop bit.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select serial ports and press ENTER.
4. From serial ports menu, type item number for main port or for auxiliary port and press ENTER.
5. From serial port type menu, select the serial port number and press ENTER.
6. Press SPACE bar for feature setting
7. Press TAB for next parameter.
8. Repeat steps 6 and 7 for all parameters.
7. Press ENTER to accept settings.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Press ESCAPE to end.

14.1.6 Arranging Caller ID Ring No-Answer (RNA)

Description: This feature offers telephone users the ability to review calls that ring at their stations while they are away. The system stores caller ID RNA records and allows users to review them and use one-button dialing to return those calls that need returning. The feature also denotes the identification of the last station that reviewed the records thus helping prevent multiple call backs to the same number. After users review the caller ID RNA records, the system deletes the records from their telephones yet retains them in the SMDA storage so that they can look at them later if they must.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name for station you wish to program and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E for edit table.
7. Type *a* to add or *r* to remove and press ENTER.
8. Enter caller ID line port numbers 1–128 (enter n, nn, nnn or n–nnn) to serve feature at this station and press ENTER.
9. Press ESCAPE three times.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–9 for each station or press ESCAPE to end.

14.2 Tracker Paging System Programming

The Tracker Paging System is a paging device that interfaces a DXP system with Tracker pagers (personal pager devices). When the Tracker Paging System is installed, you must use the following programming routines to establish proper communications between the system and individual Tracker pager users.

14.2.1 Programming Tracker Paging System Options

Description: Tracker Paging System options consist of selecting the serial port that you will use for connecting the base station, enabling or disabling Tracker Paging System operation, and selecting PC Attendant 1 through 4.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select tracker and press ENTER.
4. From Tracker menu, select options and press ENTER.
5. Enter Tracker Paging System base station number (1 through 4) and press ENTER.
6. From tracker unit options menu, select the serial port where the Tracker base station will be connected (1 through 18) and press ENTER.
7. Toggle the second field with the SPACE bar to enable/disable the Tracker Paging System option and press ENTER.
8. Toggle the third field with the SPACE bar to select PC Attendant 1 through 4 (or none) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Press ESCAPE to end.

NOTE: After you have enabled the Tracker paging system and saved your programming selections, the DXP system connects with the Tracker base station and displays the following message:

Initializing TRACKER unit, please wait. . .

If the Tracker base station is correctly installed and operational, the DXP system then displays the following message:

Installation complete, TRACKER is on line

If, however, the Tracker base station is not installed or fails to connect, the DXP system displays the following message:

Installation error, verify programming or installation

14.2.2 Making Tracker Paging System Assignments

Description: Use the following programming instructions to assign individual Tracker Pagers to a station extension number, select the pager types, and assign a block of pagers to a Tracker Paging System base station. Use this programming method for making minor modifications after the system has been installed and programmed per instructions in Section 14.2.3, *Making Initial Tracker Pager Assignments*.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From the peripherals menu, select tracker and press ENTER.
4. From tracker menu, select pager assignment table and press ENTER.
5. In the first field, enter intercom number and press TAB.
6. In the third field, enter Tracker Pager number and press TAB. (The second field is the name field that is programmed in the intercom numbers screen.)
7. In the fourth field, press the SPACE bar to enable/disable the Tracker Pager and press TAB.
8. In the fifth field, press the SPACE bar to select Tracker Pager type P1000 through P4000.

NOTE: Tracker pager designations are:

P1000 (numeric display only)
P2000 (1-line alphanumeric display)
P3000 (2-line alphanumeric display)
P4000 (4-line alphanumeric display)

9. After making pager type selection, press TAB.
10. In the fifth field, type Tracker base station's number (1 through 4).
11. When finished, press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
13. Press ESCAPE to end.

14.2.3 Making Initial Tracker Pager Assignments

Description: Use the following programming instructions to select intercom numbers, to assign pager types, and to assign individual pagers to a Tracker base station. Use this programming method to make many assignments quickly when first installing the system. This programming method overwrites any assignments previously made using the method described in Section 14.2.2, *Making Tracker Paging System Assignments.*

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From the peripherals menu, select tracker and press ENTER.
4. From tracker menu, select initialize pager assignments and press ENTER.
5. From the initialize pager assignments menu, select Intercom Number(s) and press ENTER.
6. Press CTRL-E to display Intercom Numbers Table.
7. Select a to add or r to remove intercom numbers and press ENTER.
8. Enter one intercom number or a group of intercom numbers (example: enter 101-150 to initialize those fifty intercom numbers at one time) and press ESCAPE.
9. Select pager number and press ENTER.
10. Enter pager number located on pager and press ENTER.
11. Press SPACE bar to enable or disable the intercoms and press ENTER.
12. Press SPACE bar until the pager model number you are using is displayed and press ENTER.
13. Enter the Tracker base station number (1-4) and press ESCAPE twice.
14. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
15. Press ESCAPE to end.

14.2.4 COS Programming For Tracker Access

Description: Assign tracker access to a particular station intercom or group of intercoms using the following class of service (COS) programming. (The default is yes for COS1 and COS32.)

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. From COS programming, type class (1-32) and press ENTER.
5. From COS (class number) programming, select Tracker Access.
6. Toggle the SPACE bar to select yes/no and press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Press ESCAPE to end.

NOTE: To activate this feature, you must assign the COS type that you programmed to the desired intercom(s). See Section 7.2.3, Class Of Service.

14.3 Digital Voice Announce Programming

The digital voice announce device (DVA) is an optional line-powered unit that connects to a digital station port and plays pre-recorded voice prompts and dialing instructions to incoming callers on the direct inward system access (DISA) lines.

Currently, DISA is the only DXP feature to take advantage of the DVA's voice prompting capability; therefore, for the DVA to function, you **must** have DISA lines assigned and programmed. The maximum number of DVA units you can install is limited only by the number of DXP station ports (192). Once you or the installer connects the DVA to a digital station port, the DVA identifies itself to the DXP so you do not have any phone-type programming to do. Nor is it necessary for you to program the system to send DTMF or ringing signals to activate the DVA because DISA programming determines the DVA's actions. When you use a DVA in conjunction with DISA, the DXP automatically answers the DISA lines and guides the callers with DVA originated voice prompts.

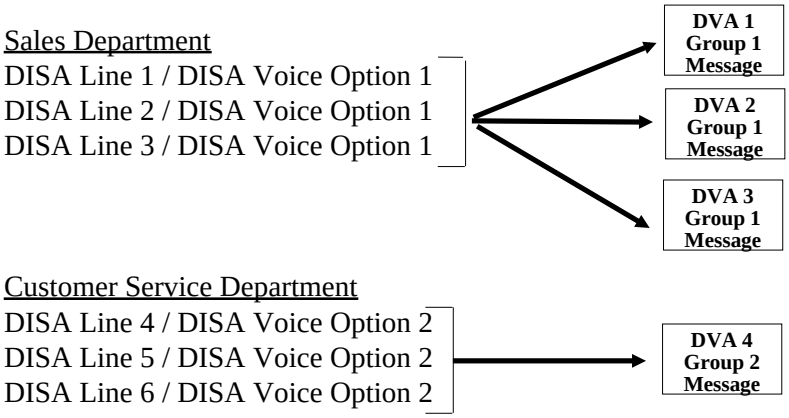
A DVA accepts and stores up to four recorded messages, with a total maximum recorded time for all messages of two minutes. Using system attendant programming, you can divide this two-minute period as necessary among the four messages or use the entire two minutes for one message. These pre-recorded messages play during an in-process call and prompt callers to dial a single digit to reach a particular intercom number or feature code. For each message type, you can assign up to ten intercom numbers or feature codes and assign a single access digit to each of these intercom numbers.

Each message type has a two-digit system index number (for example: 10 = Welcome Greeting 1, 11 = Welcome Greeting 2, and so forth). You use this index number to identify the messages when you record them. Many of the messages have a single-digit group option number appended to their names (for example: Welcome Greeting 1, Day Main Menu 1, and so forth). You, use this message group number to place messages for a particular category of caller together (all group 1 messages for sales calls, all group 2 messages for service calls, and so forth). You assign a message group to a DISA line based on the line's DISA voice option. Group 1 messages correspond with DISA voice option 1, group 2 messages with DISA voice option 2, group 3 messages with DISA voice option 3 and group 4 messages with voice option 4. You assign a voice option, and thus a message group, to a DISA line using programming procedures given is Section 8.8.2, *Enabling Or Disabling DISA Lines.*

14.3.1 Understanding The Line/Voice Option/DVA Relationships

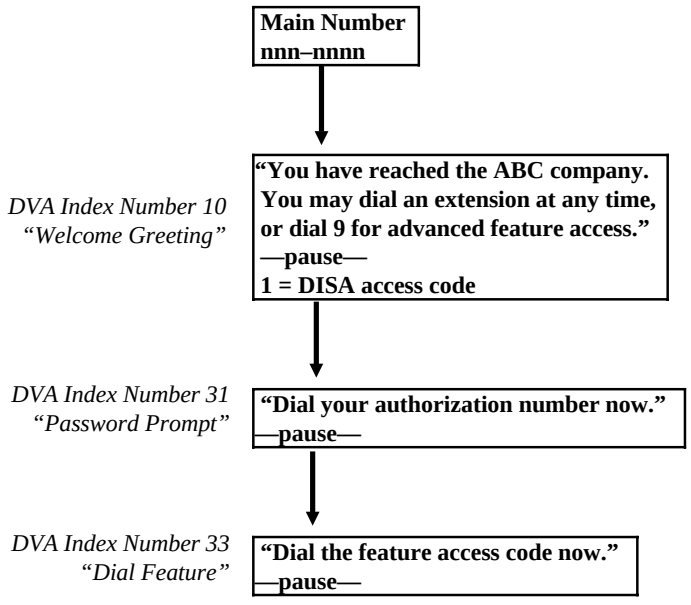
DVA Application

A company with several departments reserves all group 1 messages for the sales department and reserves all group 2 messages for the customer service department. The company attendant records the group 1 and 2 message to have meaning for the sales and customer service departments. The system programmer assigns DISA lines 1, 2, and 3 to the sales department and DISA line 4, 5, and 6 to the customer service department. He or she also programs DISA line 1–3 to have voice option 1 and DISA line 4–6 to have voice option 2. All of this allows callers to DISA line 1–3 to receive and respond to messages associated with the sales department and callers to DISA line 4–6 to receive and respond to messages associated with the customer service department.


Sales Department
DISA Line 1 / DISA Voice Option 1
DISA Line 2 / DISA Voice Option 1
DISA Line 3 / DISA Voice Option 1
DVA 1 Group 1 Message
DVA 2 Group 1 Message
DVA 3 Group 1 Message
Customer Service Department
DISA Line 4 / DISA Voice Option 2
DISA Line 5 / DISA Voice Option 2
DISA Line 6 / DISA Voice Option 2
DVA 4 Group 2 Message

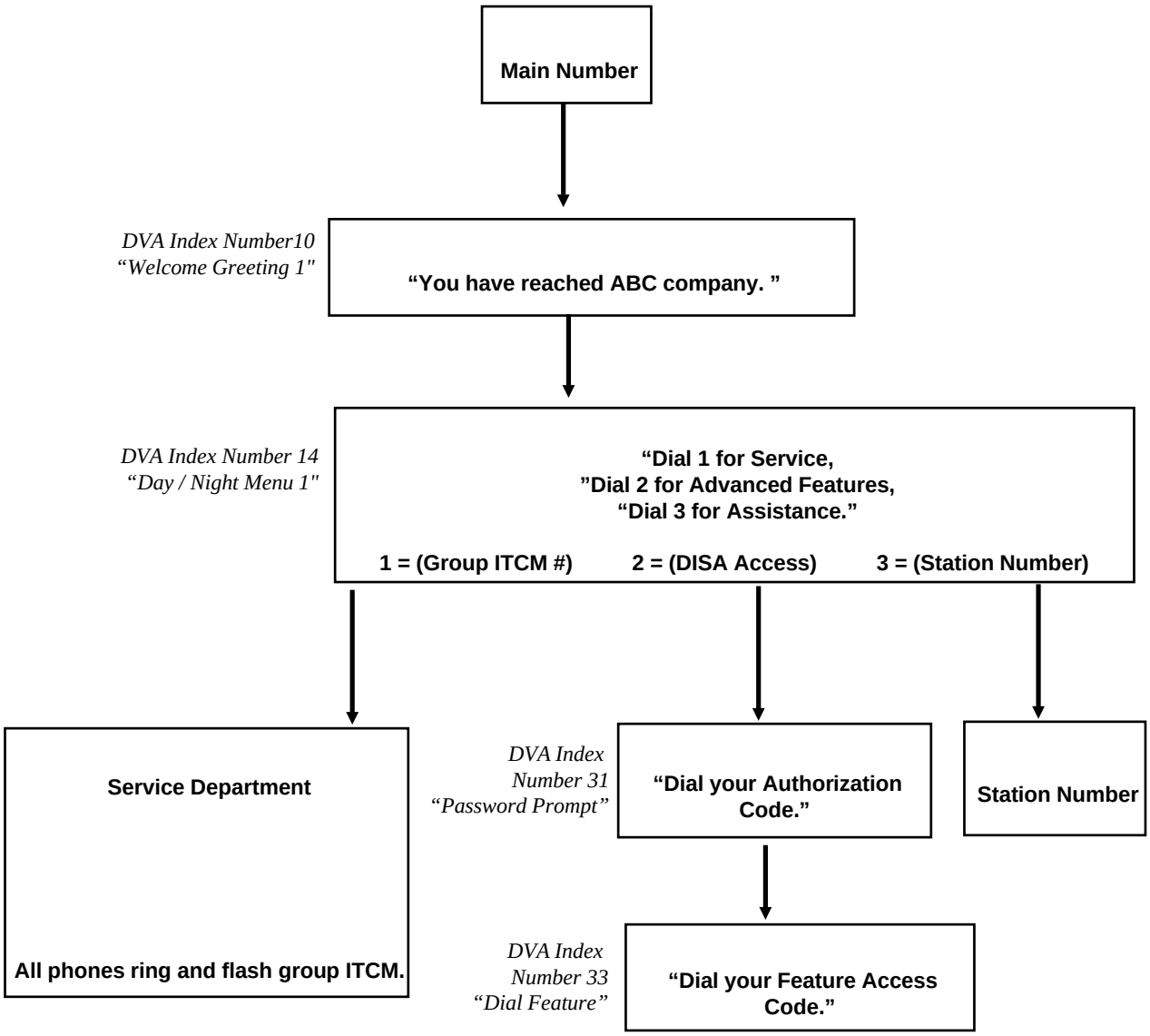
DVA/DISA Application

You can enhance the security of DISA by using the DVA. The DXP connects to the incoming call based on the programmed DISA parameters and the DVA plays the appropriate prompts to cause the caller to dial the following codes: DISA access code, authorization code, feature access code.


Main Number
nnn–nnnn
DVA Index Number 10
"Welcome Greeting"
"You have reached the ABC company. You may dial an extension at any time, or dial 9 for advanced feature access."
—pause—
1 = DISA access code
DVA Index Number 31
"Password Prompt"
"Dial your authorization number now."
—pause—
DVA Index Number 33
"Dial Feature"
"Dial the feature access code now."
—pause—

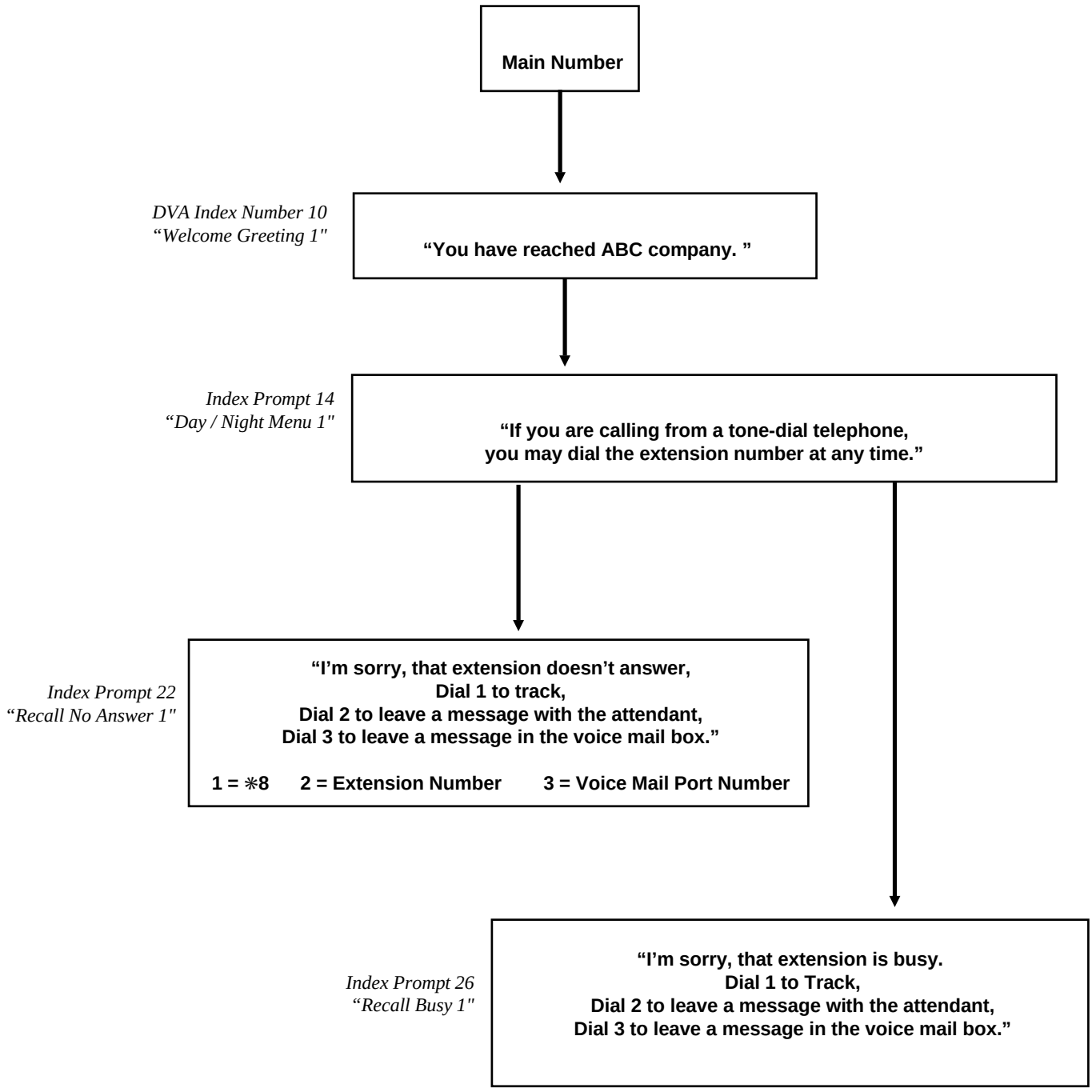
DVA Auto Attendant With Single Digit Menu Application

The DVA functions as an automatic attendant by giving callers single-digit dialing options. The DXP connects to the incoming call based on the programmed DISA parameters and the DVA plays the appropriate voice prompts to the caller such as: welcome greeting, day main greeting—menu choices, recall busy, recall no answer.



DVA/Tracker Paging System Application

The DVA gives callers single digit dialing access to the Tracker Paging System. The DXP connects to the incoming call based on the programmed DISA parameters and the DVA plays the appropriate voice prompts to the caller such as: welcome greeting, day main greeting—menu choices, recall busy, recall no answer.


Main Number
DVA Index Number 10
"Welcome Greeting 1"
"You have reached ABC company. "
Index Prompt 14
"Day / Night Menu 1"
"If you are calling from a tone-dial telephone,
you may dial the extension number at any time."
Index Prompt 22
"Recall No Answer 1"
"I'm sorry, that extension doesn't answer,
Dial 1 to track,
Dial 2 to leave a message with the attendant,
Dial 3 to leave a message in the voice mail box."
1 = ✳8 2 = Extension Number 3 = Voice Mail Port Number
Index Prompt 26
"Recall Busy 1"
"I'm sorry, that extension is busy.
Dial 1 to Track,
Dial 2 to leave a message with the attendant,
Dial 3 to leave a message in the voice mail box."

14.3.2 Defining DVA Messages

The available DVA messages include the following categories

DVA Index Number	*Message Type*	*Message Definition*
10–13	Welcome Greetings 1–4	Messages that identify company or department to caller.
14–17	Day Main Menus 1–4	System plays these messages during normal business hours.
18–21	Night Main Menus 1–4	System plays these these messages during close of business hours.
22–25	Recall No Answer 1–4	System plays these messages when the called station does not answer.
26–29	Recall Busy 1–4	System plays these messages when called station does not answer.
30	Please Hold	System plays this message callers when they page their called party.
31	Password Prompt	This message prompts callers to enter password for access to advanced DISA features
32	Account Code	System plays this message to callers who request line groups on systems that require forced account code entry
33	Dial Feature	This message plays after the caller enters password for advanced DISA features
34–37	Day Routing 1–4	If system can not provide DISA callers with the requested service, it plays this message.
38–41	Night Routing 1–4	
42	Reminder Prompt	DISA Callers who are allowed to access advance system features receive this message if they are making a line to line connection through the DXP. The message periodically prompts them to dial a code to continue the connection.
43	Digit Collection	This message prompts callers to dial a code before the system routes their call. When used with telephony services, this dialed code causes a screen showing caller's identification and data to appear on computer at called station's location. System plays the message requesting the dialed entry after a welcome message and before a day menu message. Digit collection message plays first if there is no welcome message and plays after the default routing extension if there is no day menu message. The caller dialed digits also show on the called station's display

14.3.3 Programming For DVA Operation

To program the interaction between DVA and DISA, there are several steps that you must take.

1. Program the day 1, day 2, and night ringing begin and end times using the programming procedure given in Section 6.10.18. When the system is in the night mode, the night menu message plays versus the day menu message; likewise, the night routing message plays versus the day routing message. The system goes into the night mode either manually by attendant action or automatically when the programmed times occur.
2. Program the DISA specific parameters using the Section 8.8.1, *DISA Specific Programming*, procedure.
3. Use the Section 8.8.2, *Enabling or Disabling DISA Lines*, procedure to assign DISA capability and a DISA voice option to a line.
4. Use procedures in this section to program the DVA parameters.

Programming Intercoms For DVA Messages

Description For each message type, you can assign up to ten intercom numbers and assign a single access digit to each of these intercom numbers. You can assign feature codes as well as intercom numbers. For example, if you have installed the Tracker Paging System option, you can program the Tracker Pager access code (S8) to an appropriate message and assign a single-digit dialing code to the access code. This allows DISA callers to track their called party by dialing the appropriate single-digit when prompted by voice message. The caller then enters his or her call-back number and the # symbol to complete the page.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select voice/DVA and press ENTER.
4. Enter voice message number and press ENTER.

NOTE: You may need to refer to step 5 of the following programming instructions to obtain the voice message number for the message type.

5. Make a single digit selection from the list (1 through 0) and press ENTER.
6. Enter intercom number or feature code that you wish to assign to this message and press ENTER.
7. Press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

Obtaining DVA Status Reports

Description: Use this programming procedure to obtain DVA status information (voice digit translation, voice allocation by DVA, voice allocation by message, and voice resource analysis).

Programming:
1. Press CONTROL T for main menu
2. From main menu, select printouts and press ENTER.
3. From printouts menu, select peripherals and press ENTER.
4. From peripherals menu, select voice/DVA and press ENTER.
5. Make a selection from the voice/DVA menu for the desired status printout and press ENTER.

NOTE: If you select the voice resource analysis you get a list of all message types. You may need this information to complete step 4 in the preceding programming instructions.

6. For printout type, press s for screen or p for printer and press ENTER.
7. Press any key to return to voice programming printouts menu.

Recording The DVA Messages

Description: You or the system attendant must record the messages that the DVA plays to the callers. You do this in one of two ways: either by delivering them from the telephone handset at the attendant station or by playing the contents of a professionally-supplied tape recording into the DVA memory. Each DVA stores up to four unique messages. The total message storage time is two minutes and you can divide this time as necessary among the four messages or use the entire two minutes for one message if needed. Because of the time constraints, it is a good practice to script your messages ahead of time so that you can read them aloud in a clear and concise manner as you store them in the DVA memory.

NOTE: When recording messages in a newly installed DVA, be sure to first format the DVA (clear all its current entries).

CAUTION

It is important to keep in mind that the system shares the messages among all installed DVAs. You do not control which DVA stores which message. For example, if you make eight different recordings with two DVAs, the system distributes the messages in both units. If someone later removes one unit from service, the only messages that will play are those stored in the remaining DVA. To locate which DVA stores which message, use the preceding programming instructions to obtain a DVA status report.

Programming: To format the DVA (completely erase all DVA messages),

1. Press INTERCOM and dial ✻ #0 ✻065.
2. Dial 1–192 to choose DVA port.
3. Dial 937 to confirm formatting dial ✻ to deny formatting.
4. Dial 1–192 to choose next DVA port to format.

To record a DVA message,

1. Press INTERCOM and dial ✻ #0 ✻ 061.
2. Choose voice source,
   – dial 1 to speak message into handset,
   – dial 2 to play tape recorded message into music-on-hold jack,
   – dial 3 to play tape recorded message into background music jack,
   – dial 10–43 to choose message type.

NOTE: As soon as you perform the next step, the two-minute timer starts running. Be ready to speak you message or press the PLAY button on the tape recorder as soon as you dial the replicate choice.

3. Dial 1–9 to choose number of times to replicate message.
4. Speak your message,
   –or–
   press the PLAY button on the tape recorder to start pre-recorded message).
5. Press # to end message.
6. Listen as system automatically plays the message for verification at the attendant station.
7. Press # to stop verification playback.
8. Repeat steps 2–8 until you've recorded all messages.

Editing The DVA Messages

Description: After DVA messages exist, you can play them, copy them, and delete them as necessary using the following attendant programming.

Programming: To play a previously recorded DVA message,

1. Press INTERCOM and dial ✻ #0 ✻ 062.
2 Dial 10–43 to choose message type.
3. Listen as system automatically plays the message for verification at your attendant station.
4. Press # to stop verification playback.
5 Dial 10–43 to choose next message type to hear.

To copy a previously recorded DVA message,

1. Press INTERCOM and dial ✻ #0 ✻063.
2. Dial 10–43 to choose message type.
3. Dial 1–9 to choose number of times to copy message.
4. Dial 10–42 to choose next message type to copy.

NOTE: If your installer has connected more than two DVAs to the system, the system automatically selects the DVA that will receive the copied message. Likewise, the system automatically selects the DVA that it uses for playing back the message to a caller. Additional DVAs become a shared resource for the system's memory and are not dedicated to particular lines.

To delete a previously recorded DVA message,

1. Press INTERCOM and dial ✻ *#0* ✻064
2. Dial 10–43 to choose message type.
3. Dial 937 to confirm delete or dial S to deny delete.

14.4 PC Attendant Position Programming

The computerized attendant operating position consists of a DOS-based personal computer, a proprietary interface circuit board (factory-installed in the computer expansion slot), a customized keyboard, a program diskette, and all necessary cables for connecting the equipment to the system.
The system will accept four PC attendant positions. Each PC attendant position replaces one telephone from the system because a telephone cannot be connected to the same station location that the programmer assigns to the Total Control PC attendant position.
Use the following procedures to program the system to operate with the PC attendant position.

NOTE: Follow these procedures in the order that this manual presents them as they provide a logical progression of the programming.

14.4.1 Enabling The PC Attendant Position

Description: Each PC attendant position requires a station port, two line ports, a serial data port, and a dedicated line group for operation. You must identify these items through this programming action for each PC attendant position before the equipment will function properly.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select PC attendant and press ENTER.
4. Type PC attendant number (1–4) and press ENTER.
5. Type item number for station port and press ENTER, then type 1–192 for station port . Important—disconnect any telephone that is currently installed there.
6. For line pair, type odd/even number pair that corresponds to location where cable was connected on common equipment (for example, enter 1,2 or 15,16 or 119,120 and so forth). Special instruction—Always type the odd line number first. Remember, the line numbers on each line board ascend from bottom line jack (lines 1,2) to top line jack (lines 7,8), and the line ports on the main and expansion cabinets ascend from right to left based on the board slot (line ports 1–8, 9–17, 18–26 and so forth).

   NOTE: The lines that you assign here are exclusively for PC attendant position use and cannot be used for out-going call operations. Do not assign them for any other system use.

7. For line group, type line group number (1–16).
8. For serial port, type 1 or 2 for RS-232 port 1 or 2 on the system central processor board where you connected the PC attendant position.
9. Press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Press ESCAPE twice to end.

14.4.2 Programming A Hunt List For PC Attendant Use

Description: Assign eight intercom numbers to an intercom hunt list for the PC attendant position's use. The assigned numbers must include the personal intercom number of the PC attendant position (the number for the station location that the PC attendant position occupies) and seven group intercom numbers that are set aside for its exclusive use (group intercom numbers range from 3101–3292, 4110–4292, 5000–5023) . When you assign group intercom numbers to the hunt list, the system automatically adds them to the group intercom access list for the PC attendant position.

NOTE: Do not assign the same group intercom to more than one station's intercom hunt list.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number of PC attendant position or previously assigned name and press ENTER.
5. From station programming menu, type item number for intercom hunt list and press ENTER.
6. Type personal intercom number for PC attendant position first then type seven group intercom numbers and press ENTER.
   Separate each entry with a comma (nnn,nnn,nnn,nnn)

   NOTE: Reserve these group intercom numbers for exclusive use by the PC attendant position. Do not assign them to any other station.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

14.4.3 Assigning Lines For PC Attendant Use

Description: Choose several lines that the PC attendant position can use for call origination; assign them to line group 16; assign line group 16 to a particular class of service; and assign that particular class of service to the PC attendant position. The line key on the keyboard is fixed to select line group 16. You must assign lines to line group 16 before the attendant can select a line for use.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line group programming and press ENTER.
4. Type 16 and press ENTER.
5. Type a to add lines and press ENTER.
6. Type lines to be added and press ENTER.
7. Press ESCAPE once.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to return to main menu.
10. From main menu, select stations and press ENTER.
11. From stations menu, select station COS programming menu and press ENTER.
12. Type class of service number (1–32) and press ENTER.
13. From the COS programming menu, type item number for line group access and press ENTER. Remember—use CONTROL N to find the correct screen.
14. Type 16 and press ENTER.
15. When finished, Press ESCAPE twice.
16. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
17. Press ESCAPE to return to main menu.
18. From main menu, select stations and press ENTER.
19. From stations menu, select station programming menu and press ENTER.
20. Type personal intercom number of PC attendant position or previously assigned name and press ENTER.
21. Type number for class of service and press ENTER.
22. Type class of service number that has line group 16 assigned and press ENTER.
23. When finished, press ESCAPE twice.
24. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
25. Press ESCAPE to end.

14.4.4 Assigning The PC Attendant Position Text Messaging Buttons

Description: Use this programming procedure to assign special text messaging functions to system telephone buttons. User's can press these buttons to access the text messaging feature provided by the PC attendant position. Program the telephone to provide the following button functions:

Text Message button for the user to press to step forward through the fields of a message that shows in the telephone's display window,

Print button for the user to press to send the displayed message to an attendant selected data printer for hard copy printout,

Next button for the user to press to sequence through a group of stored messages,

Previous button for the user to press to back-up through the fields of a message that he or she has already read,

Delete button for the user to press to erase a message after he or she has read it or sent it to the data printer,

Quit button for the user to press to end a text messaging session.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select button mapping and press ENTER.
4. Type prime intercom number or previously assigned name and press ENTER. The VDT presents a button map of the current button functions for the requested station shown for your review.
5. Type code (L1–L25) for button that you wish to program.
6. Type one of the following mnemonics and press ENTER.
   OAI59 = Delete button
   OAI60 = Print button
   OAI61 = Previous field button
   OAI62 = Next message button
   OAI63 = Quit button
   OAI64 = Text message/next field button
7. Repeat steps 5 and 6 until you have assigned all test messaging buttons and press ENTER.
8. Press ESCAPE and repeat steps 4 through 7 for each station.
9. When finished, press ESCAPE twice.

14.4.5 Mapping PC Attendant Position Function Keys

Description: The DXP adds programmable function keys to the PC Attendant Position. The programmable features are in addition to the fixed features currently provided by function keys F1 through F12. You can assign a different feature to each function key from the list of functions shown in Section 7.3.1, *Feature Mnemonic List*.

Programming:

1. Press CONTROL T for main menu,
2. From main menu, select stations and press ENTER,
3. From stations, select PC attendant and press ENTER,
4. Type attendant number (1–4) and press ENTER,
5. From PC attendant menu, select button mapping and press ENTER,
6. Press CONTROL E for button map of function keys and press ENTER,
7. Type button number (L1–L12) and press ENTER,
8. Type mnemonic (type ? for a description of mnemonic if you need it) for desired feature and press ENTER,
9. Repeat steps 7 and 8 until all feature button are programmed,
10. When finished, press ESCAPE twice,
11. Type y to accept changes, n to reject them, or r to resume editing and press ENTER,
12. Press ESCAPE to end.

Operation: To access the programmed functions on the PC Attendant Position, the user must press and hold the CTRL button while pressing the desired function button on the keyboard.

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14.5 Voice Mail Programming

After connecting an voice mail system to the DXP system per the information provided in IMI89-080, *Installation Instructions For Installing Voice Mail Equipment On The DXP Digital Communications System*, program the DXP to operate properly with it using the procedures detailed below. They are presented here in a typical order of progression but you can perform them in any order that is convenient. Also refer to the Section 7.1.5, *Call Forward*, programming procedure.

14.5.1 Arranging Station Ports For Voice Mail Use

Description: After you or your installer has connected voice mail ports to the system station ports through the appropriate interface devices (for example, the VMI-X interface device used with analog station ports, the ATI-D-1PT interface device used with the digital station ports, or the DXIST station board used with industry-standard telephone ports), you must identify the station ports where these devices are connected.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From station menu, select phone types and press ENTER.
4. Type row number for station port type
   (ExecuTech = analog, DigiTech = digital, IST = industry standard)
   and press ENTER.
5. Type row number for device connected to station port (VMI-X or ATI-D-1PT)
   and press ENTER. (This step not required for IST.)
6. Type number of station port (1–192) and press ENTER.
7. Repeat steps 1–6 for each station port used to interface with the voice mail system.

14.5.2 Assigning Intercom Numbers To Voice Mail Connections

Description: You must identify the station intercom number of each voice mail connection and link these numbers together to form a circular hunt group for call handling purposes. For example, assign intercom numbers 121, 122, 123, and 124 to voice mail ports 1, 2, 3, and 4 then link 121 to 122, 122 to 123, 123 to 124, and 124 to 121.

Programming Hint: To make the LCD readouts at the system telephones more descriptive during call transfers, use the Section 7.2.2, *Display Name/Full Name*,programming procedure to assign a descriptive name to the personal intercom numbers. If you do this, be sure to name each voice mail port differently. For instance, you can name them VM1, VM2, VM3, and VM4; however, do not name each port VM without personalizing it further with a unique suffix (such as 1, 2, 3, 4 or A, B, C, D for example).

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select voice mail and press ENTER.
4. From voice mail menu, type the row number for the voice mail port (1–32) and press ENTER.
5. Type the personal intercom number for the station port that this voice mail port is connected to.
6. Press TAB for linked station column and type personal intercom number for station port to be linked to the station port named in step 5.
7. Press ESCAPE and repeat steps 4–6 for next row number.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

14.5.3 Arranging Voice Mail Call Transfer Parameters

Automatic Attendant Transfer On Busy

Description: You can enable automatic attendant transfer on busy for individual station ports if you wish. With this feature enabled, the system will ring a busy telephone when the voice mail system is attempting to transfer a call to it thus giving the user the option of leaving his or her present call and taking the new one. With the feature disabled, the busy telephone is not signalled by the presence of a new call and voice mail will automatically route it to the busy telephone's voice mail box.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. When finished press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Immediate Transfer

Description: You should choose the automatic attendant immediate transfer mode for voice mail transfers. It allows the system to transfer a call as soon as it answers. However, if you turn on the voice mail screen and confirm options (see the voice mail programming manual for details), do not turn on the DXP immediate transfer mode. Immediate transfer is a system-wide parameter and affects all telephones in the system.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

14.5.4 Assigning Transfer-To-Voice Mail Button

Description: A system user can use a pre-programmed button to transfer an incoming call directly to a voice mail box so the caller can leave a message. You must use the button mapping programming procedure to assign this Transfer-To-Voice Mail button at a system telephone.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select button mapping and press ENTER.
4. Type prime intercom number or previously assigned name and press ENTER. The VDT presents a button map with current button functions for requested station shown for review.
5. Type code (L1–L25) for button that you wish to program and press ENTER.
6. Type mnemonic for transfer-to-voice mail button and press ENTER.

*NOTE: Type **XVM** plus a two-digit code (0–32) that equals one of the voice mail ports. Usually, you will enter the code for the first voice mail port and let the extension number linking (that you have previously arranged) decide which voice mail port actually handles the call. However if you have arranged voice mail ports into groups for department answering, enter the voice mail port code for the group that also includes the telephone that you are button mapping.*

7. When finished, press ESCAPE twice.

14.5.5 Arranging Voice Mail Ringing Options

Description: The DXP system automatically enables ringing line preference at the voice mail station ports. With this feature enabled, the voice mail system's automatic attendant will answer calls. You can use direct, delayed, or night ringing features to determine how quickly or when it does this. With direct ringing, calls ring at the voice mail port immediately. With delayed ringing, the calls wait before ringing the voice mail port. This gives you the flexibility of having calls direct ring at a telephone where they can be answered by a human operator before they delay ring and the automated attendant answers them.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number of voice mail station port and press ENTER.
5. From station programming menu, type item number for desired ringing and press ENTER.
6. Press CONTROL E.
7. Type a for add or type r for remove and press ENTER.
8. Type line port number for lines assigned to voice mail port 1–128 (n,nn,nnn, or n–nnn) and press ENTER.
9. When finished press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each voice mail port or press ESCAPE to end.

14.5.6 Assigning Voice Mail Identification (ID) Number

Description: As an option, you can assign an identification number to each DXP line so that the voice mail system can provide customized call handling on a per line basis. Use voice mail system programming to match this ID number to a particular personal directory or transaction box within the voice mail system. When the DXP routes a call that is ringing at a particular line to the voice mail system to be answered, it routes it with the ID number. The voice mail system then sends the call to the box that corresponds to the line's ID number. You can use voice mail system programming to construct customized answering prompts for the individual boxes. This allows the IDed DXP lines to be answered in a customized manner by the voice mail system's automatic attendant.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select line and press ENTER.
3. Type port number of line to be programmed (1–128) and press ENTER.
4. From the line menu, select item number for feature and press ENTER.
5. Type the identification (ID) number and press ENTER.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 3–7 for each line or press ESCAPE to end.

14.5.7 Enabling Extended DTMF Tones For Voice Mail Use

Description: The system provides a means by which you can set the length of the DTMF tones that it generates when a user dials a number from his or her telephone. Since the voice mail system may require a different DTMF tone length than that which you have provided for the telephones, the system provides a means for you to set a separate DTMF tone length for voice mail station ports. It defaults the length to 80 msec, but you can program other lengths as needed.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

14.5.8 Setting The Voice Mail Integration Digits

Description: You can choose the DTMF digits that the DXP sends to a voice mail system. A voice mail system uses these DTMF digits to determine system and station status so that it can properly process a call. You must be versed in your voice mail's requirements before you can assign DTMF integration digits in the DXP. The system defaults the voice mail parameters to match the Comdial voice mail system. Certain applications in countries with dialing plans different than the United States may require different integration digits. The default digits are shown in the following list and discussed below:

Follow Extension ID = 2	Intercom/Answer Confirmation = 1
Busy = 2	Do Not Disturb = 3
Incoming Intercom Answer = 9	Disconnect = A

Follow Extension ID – When the voice mail system receives a forwarded call from a ring no-answer (RNA) or busy station, the DXP sends to the voice mail system the extension number of the forwarded call followed by this DTMF digit (n). The DXP sends this digit within 500 ms of the time the voice mail system answers the call. For example, if extension 101 is forwarded to voice mail and voice mail answers a forward RNA or busy forwarded call, the DXP sends 101n to the voice mail system within 500 ms of the answer time.

Intercom/Answer Confirmation – The DXP sends this DTMF digit to the voice mail system to confirm that an intercom path (without dial tone) is available for the voice mail system's call transfer or dialing use. The DXP sends this digit within 500 ms of the time it detects the voice mail system's off-hook or hookflash condition. The DXP also immediately sends this digit to the voice mail system when a station answers a voice mail transferred call. This action can alert the voice mail system to disconnect and leave the parties connected.

Busy – If the voice mail system transfers a call to a station that is busy on a call, the DXP sends this DTMF digit to the voice system. When the voice mail system receives this digit, it can abandon the transfer, reconnect to the call, and offer the caller whatever options the the voice mail system has available in its programming. If the DXP's auto attendant transfer on busy feature is active, the DXP will not send the DTMF digit to the voice mail system thus allowing the system to transfer a second call to the station.

DND – If the voice mail system transfers a call to a station that is in the do not disturb (DND) mode, the DXP sends this DTMF digit to the voice system. Receiving this digit allows the voice mail system to distinguish between a busy and a DND condition and offer the caller the appropriate choices.

Incoming Intercom Answer – The DXP sends this DTMF digit to the voice mail system when a station user makes an intercom call to the voice mail system. This action allows the voice mail system to distinguish between internal and external calls and offer the caller appropriate prompts and dialing options.

Disconnect – When an outside line or intercom party hangs up, the DXP sends this DTMF digit to the voice mail system to command an immediate disconnect. For outside calls, the central office (CO) must provide disconnect supervision to the DXP and you must program the DXP line for abandon hold release and disconnect supervision (see *Section 8.1* for details). At default, the DXP sends the DTMF tone for the *A* character as the disconnect digit. Since a caller cannot dial an *A* from a telephone. This feature eliminates callers from causing an accidental disconnect by dialing this digit on their telephone's dial pad.

Programming The Voice Mail Integration Digits

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select voice mail and press ENTER.
4. From the voice mail menu select integration digits and press ENTER.
5. From the integration digits menu, type row number for item and press ENTER.
6. Type entry and press ENTER.
7. Repeat step 6 until finished.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE twice to return to main menu.

14.6 Modem Setup

Description: The system supports the operation of the DXMDM serial data modem. The DXMDM is a general-purpose, Hayes*-compatible, 300, 1200, and 2400 automatic baud detect, serial data modem that receives its operating power and configuration programming from the DXP system. After you install and connect the DXMDM per the details described in IMI89-139, Installation Instructions For The DXMDM Modem, you must program the modem port number into the system memory. Since the serial data port default for both the modem and the SMDR serial data printer is main port 2, it is a good practice to choose a different modem port if the site employs both devices.

NOTE:The main serial data ports are 1 and 2, and the serial data ports on the first DXAUX board are 3–6 (upper slot) and 7–10 (lower slot). The serial data ports on the second DXAUX board are 11–14 (upper slot) and 15–18 (lower slot). The port numbering of the auxiliary serial data ports are fixed. This means that if the system provides only one DXOPT-COM located in the lower slot on the first DXAUX board, the auxiliary serial data ports are 7–10.

The DXMDM modem depends upon the DXP for both its power and its configuration, and you must set switch SW7, located on the CPU board, to its ON setting to ensure continuous modem operation. This setting ensures that the modem will reset properly if you cycle the DXP power. You should leave this switch set to its ON position for continuous modem operation.

If you disconnect the modem power cord from the DXP precharge port, you must reset the modem after you reconnect the power cord. Reset the modem by switching SW7 to OFF and then to ON. (Alternately, you can use the system manager programming from the programming station to reset the modem. To do this, enter the system manager programming mode, and dial 18#.)

Normally, you do not program the initialize string because it defaults with the necessary values for DXMDM operation; however, you may adjust the rings-before-answer value if necessary. To do this, set the S0= value to the desired number (1 = one ring, 2 = two rings, and so forth).

The initialize string characteristics are the following standard Hayes*-compatible values:

AT	attention modem command
S0=1	number of received rings before modem answers (one)
M0	speaker completely off
Q1	result codes not sent
E0	echo off

Regardless of which port you choose for modem connection, the system arranges for that port to automatically match the baud rate and serial data parameters of the modem.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select serial ports and press ENTER.
4. From serial ports menu, select modem setup and press ENTER.
5. From modem setup menu, type item number for port and press ENTER.
6. Type number for modem port and press ENTER to accept setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

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QuickQ DXP

Automatic Call Distributor

Technical Manual

COMDIAL®

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Radio Frequency Interference

The QuickQ digital voice announcer (DVA) contains incidental radio frequency generating circuitry and, if not installed and used properly, may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference to radio and television reception; in which case the user is encouraged to take whatever measures may be required to correct the interference. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient the television or radio's receiving antenna, and/or relocate the DXP, the individual telephone stations, and the radio or TV with respect to each other. If necessary, the user should consult the manufacturer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the Government Printing Office, Washington D.C. 20402. Stock No. 004-000-00345-4.

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This digital apparatus does not exceed the (Class A) limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le pre'sent appareil nume'rique n'emet pes de bruits radioe'lectriques de'passant les limites applicables aux appareils nume'riques (de la class A) prescrites dans le Re'glement sur le brouillage radioe'lectrique e'dicte' par le ministe're des Communications du Canada.

CAUTION

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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Section 1
Introducing The QuickQ System

Understanding The Manual Organization

Section 1: Introducing The *QuickQ* System—Provides general information on QuickQ and system requirements.

Section 2: Installing The *QuickQ* System—Provides site planning considerations and instructions on the mounting of the Digital Voice Announcer (DVA).

Section 3: Wiring The *QuickQ* System—Provides wiring information for the voice channels on the DVA, PC to DVA and DXP to PC.

Section 4: Programming The DXP Digital Communications System—Provides the Comdial programming requirements.

Section 5: Setting Up The Personal Computer—Provides the information on the installation of the *QuickQ* software into the PC and the initial programming of the *QuickQ*.

Section 6: Reviewing The *QuickQ* Components—Provides the description of the *QuickQ* DVA components.

Section 7: Testing and Troubleshooting—Provides the test procedure to setup *QuickQ* and provides information on troubleshooting problems on *QuickQ*.

Section 8: Installing The New Voice Channel Cards—Provides information on how to install additional cards.

Appendix 1: Using *QuickQ* With A Mouse—Describes mouse usage with the *QuickQ* system.

Appendix 2: Reviewing The *QuickQ* Programming Road Map.

Listing The Related Publications

Additional publications that are applicable to the QuickQ automatic call distributor and DXP digital communication system include the following publications.

- GCA70-271 *QuickQ* DXP System Manager's Guide
- GCA70-278 *QuickQ* DXP Agent's User Guide
- GCA70-302 *QuickQ* DXP Supervisor's User Guide
- DXLIT-016 DXP Digital Communications System System Reference Manual
- DXLIT–028 DXP *Plus* Digital Communications System Reference Manuals

Defining The QuickQ System

QuickQ is a fully integrated Automatic Call Distribution System for Comdial DXP digital communications system.

An Automatic Call Distributor (ACD) is the single most important cost-saving communications tool available to the manager of an incoming call center.

QuickQ is designed to handle a large volume of incoming calls as efficiently and economically as possible. *QuickQ* processes incoming calls by distributing the call to available agents on an equitable basis or by playing announcements to the calling party until an agent is available. Having installed *QuickQ* in a call center, the speed, efficiency, and management control usually results in a 20 to 40 percent increase in the productivity of the agent force, and a 10 to 20 second decrease in the average speed of call answering.

The four primary functions of *QuickQ* are as follows:

1. It provides a waiting queue to ensure that callers are answered in the order that they are received and with the appropriate priority. Because of this, the system handles calls in a more timely and efficient manner.
2. The system can provide a number of pre-recorded announcements to play to the calling customers, if no agent is available, to entice the caller to wait in queue.
3. The system distributes the workload evenly among the agents to allow an equitable assignment of duties, which in turn facilitates greater productivity.
4. *QuickQ* provides comprehensive statistical management reports to allow efficient control of agent assignments and lines.

The advent of microprocessor technology has allowed the cost of ACD systems to be more affordable for small to medium call centers. Hence, ACD systems are becoming increasingly popular with call centers with under 40 agents.

Describing The QuickQ Functions

QuickQ is a PC-based system for redirecting of incoming calls to a human operator or to a digital voice announcement until a human operator is available. *QuickQ* interfaces to the Comdial DXP digital communications system through the Open Architecture Interface (OAI) to acquire information and control the ACD functions. The message channels of the *QuickQ* Digital Voice Announcer (DVA) interface to the DXP through the station port(s). This allows pre-recorded messages to be played out to calling parties. The *QuickQ* PC communicates with the DVA through an RS-232 serial communication link. This communication link allows the PC to control the messages being played on the voice channels.

Detailing The QuickQ Basic Options

QuickQ is available in two packages. The station capacity of the two packages differ but the feature availability of each package is the same. Both packages include real-time status display screen of information that the system continuously updates every three seconds. This display allows supervisors to quickly identify conditions such as the call-waiting time. The packages also include a comprehensive management reporting scheme that presents information in both numerical and graphic format.

	Package A	Package B
Lines	64	64
Messages	16	16
Real Time	Yes	Yes
Groups	16	16
Number of Active Agents	12	48
Maximum Agents	48	250

Understanding The System Components

The Telephone Switching System

QuickQ is an add-on application, designed specifically for Comdial DXP and DXP *Plus* digital communications systems. The DXP or DXP *Plus* equipment performs the telephone call switching functions.

The Digital Voice Announcer

The *QuickQ* Digital Voice Announcer (DVA) is a stand alone voice processing system designed to directly interface with the DXP's station ports. It provides voice announcements, recording and playback under the control of the Central Call Processing unit. In a busy call center, when all agents are busy, the DVA intercepts incoming calls and plays out pre-recorded voice announcements.

The Central Call Processor

The Central Call Processor is the brain of the *QuickQ*. It is a DOS-based, 486-type computer system that controls and monitors call traffic throughout the *QuickQ* system with special-purpose software programs. Refer to Section 2 for a detailed description of the Central Call Processor hardware requirements.

The ACD Telephone

QuickQ is a fully integrated ACD system for Comdial digital telephones. For best results, use LCD speakerphones for the ACD functions and operations. Their two line display shows the call-processing information and operator function prompts and their three interactive buttons allow selections of *QuickQ* options and features.

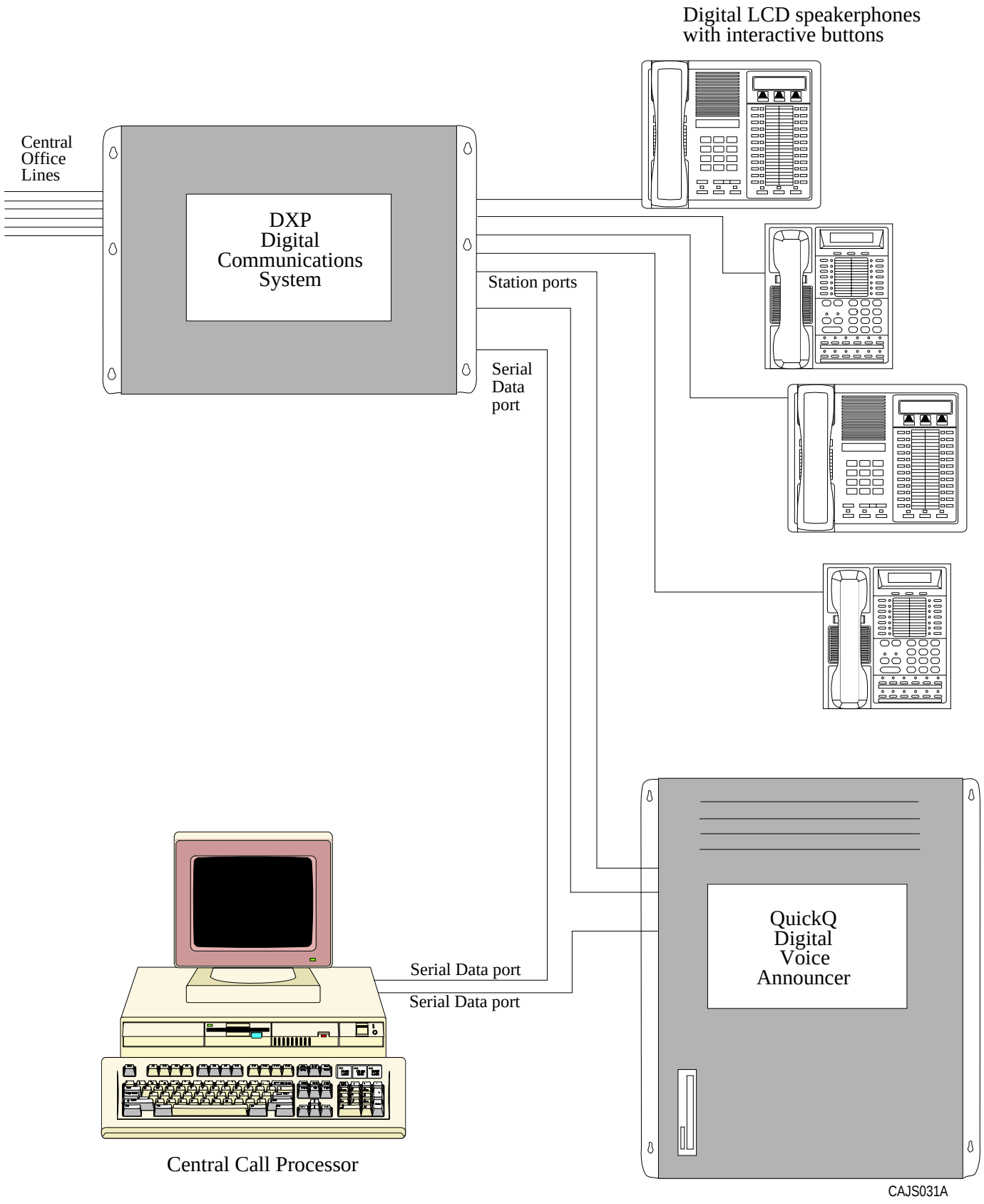


Figure 1-1. Overviewing The QuickQ System

Section 2
Installing The QuickQ System

This section provides the basic hardware installation requirements for the *QuickQ* Digital Voice Announcer (DVA).

Reviewing The Installation Check List

Review this list of *QuickQ* System components, suggested additional supplies, and required tools and hardware.

QuickQ Package Contents

The *QuickQ* packages (product codes ACDXPKA and ACDXPKB) include the following items:

- Central Call Processor equipped as follows:
  —DOS-based personal computer with DOS operating system and 2 megabytes of memory,
  —VGA color monitor,
  —hard and floppy disk drives with appropriate controller boards,
  —bus mouse,
  —101-key extended keyboard,
  —memory manager software.
- OAI security key
- *QuickQ* software disks
- *QuickQ* PROTECKEY,
  —Navy Blue (ACDXPKA—software A),
  —Gray (ACDXPKB—software B),
- *QuickQ* literature package
  —GCA70-278 Agent's User Guide
  —GCA70-302 Supervisor's User Guide
  —GCA70-271 System Mamager's Guide
  —IMI66-109 Technical Manual
  —GCA40-110 Warranty/Registration Card

When you order the *QuickQ* package, you will also need to make a separate order for the current DXP or DXP *Plus* software and memory. Those product codes are as follows:

- ACDXP–KIT for DXP
  —DXP Software card
- ACPLS–KIT for DXP *Plus*
  —DXP *Plus* software
  —DXP *Plus* memory board
- Installation cable kit
  (product PK030-000) that includes the following packaged assemblies:

Package Item	Contents
PK030-001 ACD, Mod. Jack	(1) Standard six-position modular jack (1) Standard three-pair line cord—six wires with the standard roll in the pin out from one end to the other
PK030-002 ACD, DB25S	(1) Standard six-position modular jack (1) Modular to 25-pin EIA adapter with female DB25 connector (1) Standard three-pair line cord—six wires with the standard roll in the pin out from one end to the other
PK030-003 ACD, DB9S	(1) Standard six-position modular jack (1) Modular to 9-pin EIA adapter with female DB9 connector (1) Standard three-pair line cord—six wires with the standard roll in the pin out from one end to the other

DVA Package Contents

The DVA package (product code ACDXP-DVA16-100) is separately available and includes the *QuickQ* Digital Voice Announcer (DVA). The DVA package also includes a 66-type connector block that is factory-connected to a 25-pair cable. The cable is terminated with a 50-pin D connector that mates with a connector on the DVA.

Voice Card Package Contents

The DVA voice cards (product code ACDXP-VCC-4) that you install in the DVA are also separately available.

Additional Materials Required

You will need to supply the following items:
25-pair cable and 6-wire cable for house wiring,
66-type station connector block,
four or eight foot section of 3/4–inch thick plywood backboard, four #8 x 3/4–inch wood screws,
AC power surge protector (recommended).

Tools And Hardware Required

- Fasteners—wood screws, toggle bolts, or -wall anchors
- Screwdriver—to match fasteners
- Electric drill—if prepared holes are required
- Connecting tool—for fastening wires to a 66-type connector block
- Crimping tool—for 623-type modular plugs

Mounting Considerations

Attach the DVA cabinet vertically to any sturdy, flat surface or vertically rack-mounted if desired. Vertical mounting promotes proper convection air current flow for cooling purposes.

Because of the current listing requirements of UL 1459, the length of the AC line cord on the equipment cabinet is a maximum length of five feet; therefore, the cabinet must be located within four feet of a proper electrical outlet. The equipment requires a dedicated 117VAC 15 AMP circuit, with a third-wire ground, supplied to a standard electrical outlet (NEMA 5-15R).

Be sure that the mounting location is secure, dry, provides adequate ventilation, and is not exposed to direct sunlight or a strong magnetic field. Be sure that the temperature range of the location is within 32-122 degrees F (0-35 degrees C), and the relative humidity is less than 90 percent non-condensing.

If the mounting surface is damp or if it is of a concrete or masonry material, you must attach a backboard to the mounting surface to be used for equipment mounting. Suitable mounting backboards are available commercially or you can construct one using 3/4-inch plywood cut to size.

Mounting The Equipment

Typically, you should mount the *QuickQ* DVA cabinet near the DXP installation; however, you can locate the DVA cabinet at a maximum distance of 1000 feet from the DXP if you use #24 twisted-pair wiring. You must locate the Central Call Processor (personal computer) within 500 feet of the DXP and DVA cabinets. If you exceed this distance, you must install limited distance modems at either end of your cable run.

1. Unpack and carefully inspect all equipment for shipping damage. Notify the shipper immediately of any damages found. Verify that the packages contain all parts and accessories needed for proper installation and operation.
2. If a backboard is required at the mounting location, attach it securely to provide a stable mounting surface for the equipment.
3. Hold the DVA cabinet against the mounting surface, level it, and mark the location of the two upper mounting holes.
4. Drill holes in the mounting surface of a proper size to accommodate the hardware being used. If necessary, prepare these holes with inserts, anchors or other attachment devices as dictated by the type of mounting surface.
5. Insert the two top screws into the mounting surface and tighten them to within approximately 3/16-inch of the surface.
6. Hang the cabinet on the top screws using the mounting holes located on the rear of the cabinet. Note that these holes are elongated with an enlargement at one end. This feature allows the cabinet to snap down on the screws to secure the mounting when the cabinet is hung on them.
7. Install the remaining two mounting screws through the lower mounting holes in the DVA cabinet and into the mounting surface.
8. Tighten all four screws into place.
9. Mount the *QuickQ*-supplied and wired 66-type connector block near the DVA cabinet (typically within 5 feet or less).

Section 3
Wiring The QuickQ System

The *QuickQ* Digital Voice Announcer (DVA) includes one to four voice channel cards with each card providing four voice ports. Before wiring, insure that there are sufficient DXP digital station ports available at a station connector block to interface with the available DVA voice ports (maximum of 16 required).

CAUTION

You must connect all four voice ports from each voice channel card to station ports from the same DXP station board or the QuickQ system will not function properly.

Wire the installed equipment using the PK030-000 installation cable kit. The cable kit includes the separately-packaged, factory-wired items described in the following list:

Package Item	Contents
PK030-001 ACD, Mod. Jack	(1) Standard six-position modular jack (1) Standard three-pair line cord—six wires with the standard roll in the pin out from one end to the other
PK030-002 ACD, DB25S	(1) Standard six-position modular jack (1) Modular to 25-pin EIA adapter with female DB25 connector (1) Standard three-pair line cord—six wires with the standard roll in the pin out from one end to the other
PK030-003 ACD, DB9S	(1) Standard six-position modular jack (1) Modular to 9-pin EIA adapter with female DB9 connector (1) Standard three-pair line cord—six wires with the standard roll in the pin out from one end to the other

In addition to the cable kit components, you need the OAI protect key and the *QuickQ* PROTECKEY that are supplied in the *QuickQ* package. These keys unlock the software and allow the *QuickQ* system to operate through the DXP's open architecture interface.

The *QuickQ* package also supplies a 66-type connector block that is pre-wired to a 25-pair cable and a 50-pin connector. The cable connector mates with the connector located on the DVA cabinet.

You must supply the following components:

- 25-pair cable and a 66-type station connector block to interconnect the DXP and the DVA,
- 6-wire cable to interconnect the DXP and the personal computer.

Connecting The Personal Computer To The DVA

1. Locate the kit-supplied modular jack that is labeled LINK ASSEMBLY FROM PC TO 66-BLOCK, and mount it within seven feet of the computer location. .
2. Select the kit-supplied modular to 9-pin EIA adapter, connect it to the computer's COM1 serial data port, and secure the adapter with the screws provided.
3. Use 6-wire cable to connect the modular jack that you installed in step 1 with the QuickQ-supplied 66-type connector block.
4. Use a kit-supplied line cord to connect the kit-supplied modular to 9-pin EIA adapter to the jack you installed in step 1 per the following house wiring table.

House Wiring Table		
QuickQ 66-Type Connector Block		Kit-Supplied Type 625A-6 Moduar Jack
Clip Terminal	Terminal Name	Pins
45	RXD	4
46	TXD	3
47	no connection	2
48	GND	5
49	DTR	1
50	DSR	6

QuickQ Modular To 9-Pin EIA Adapter

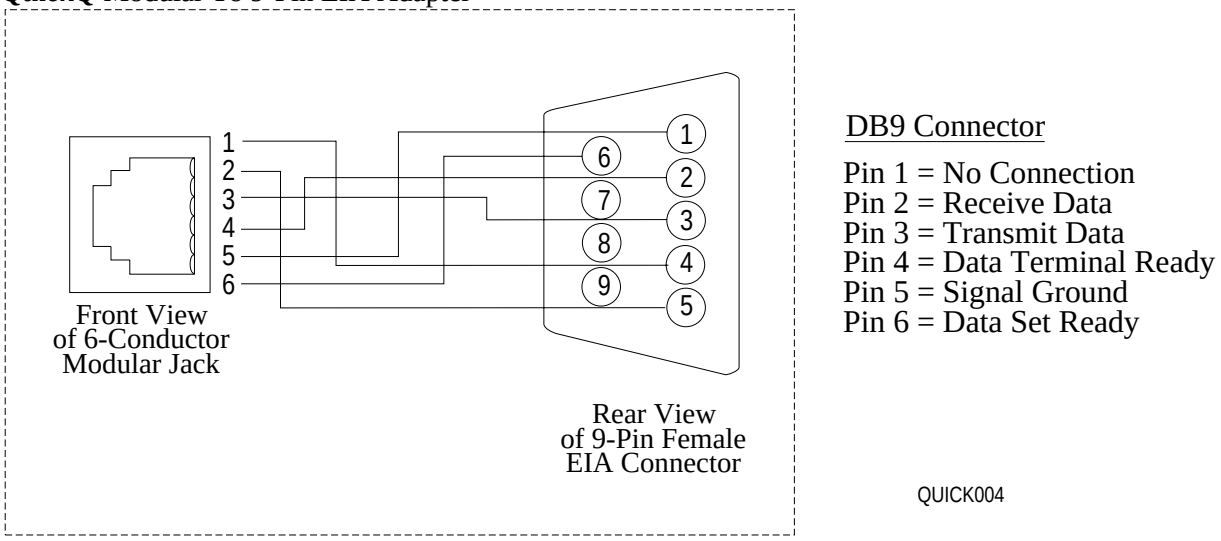
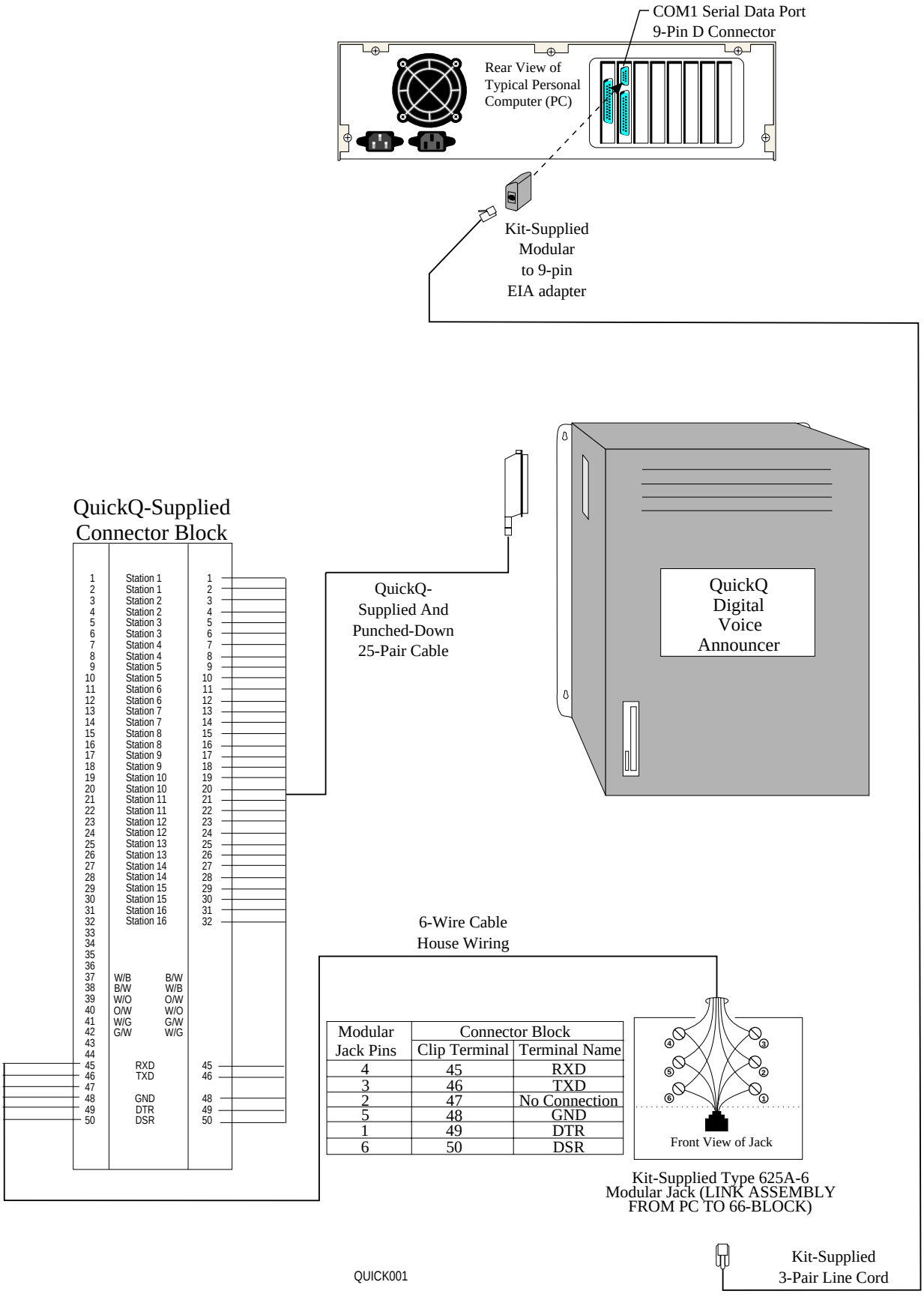


Figure 3-1. Detailing The Kit-Supplied Modular To 9-Pin EIA Adapter



Modular Jack Pins	Connector Block	
	Clip Terminal	Terminal Name
4	45	RXD
3	46	TXD
2	47	No Connection
5	48	GND
1	49	DTR
6	50	DSR

Figure 3-2. Connecting The Personal Computer To The DVA

Connecting The Personal Computer To The DXP or DXP Plus

1. Locate a kit-supplied modular jack labeled LINK ASSEMBLY FROM DXP TO 66-BLOCK FOR PC, and mount it within seven feet of the DXP cabinet.
2. Locate a kit-supplied modular jack labeled LINK ASSEMBLY FROM PC TO 66-BLOCK FOR OAI, and mount it within seven feet of the personal computer.
3. Use 6-wire cable to connect the modular jacks that you installed in steps 1 and 2 to the QuickQ-supplied 66-type connector block per the following house wiring table.
4. Connect the OAI Protect Key to the computer's COM2 serial data port 25-pin connector, and secure the adapter with the screws provided.
5. Select the kit-supplied modular to 25-pin EIA adapter , connect it to the OAI Protect Key, and secure the adapter with the screws provided.
6. Using a kit-supplied line cord, connect the DXP's serial data port 1 to the modular jack you installed in step one. If you are using the DXP–Plus, you must connect the PC to a serial data port on a communications card (for more information on communications card installation, see IMI89–190).
7. Using a kit-supplied line cord, connect the modular to 25-pin EIA adapter that you installed in step 5 to the modular jack you installed in step two.
8. Connect the QuickQ PROTECKEY to the computer's 25-pin parallel connector.

House Wiring Table					
Link Assembly From DXP To 66-Block For PC Modular Jack	***QuickQ***-Supplied 66-Type Connector Block				Link Assembly From PC To 66-Block For OAI Modular Jack
Pins	Terminal Name	Clip Terminal	Clip Terminal	Terminal Name	Pins
4	W/B	37	37	B/W	3
3	B/W	38	38	W/B	4
2	W/O	39	39	O/W	5
5	O/W	40	40	W/O	2

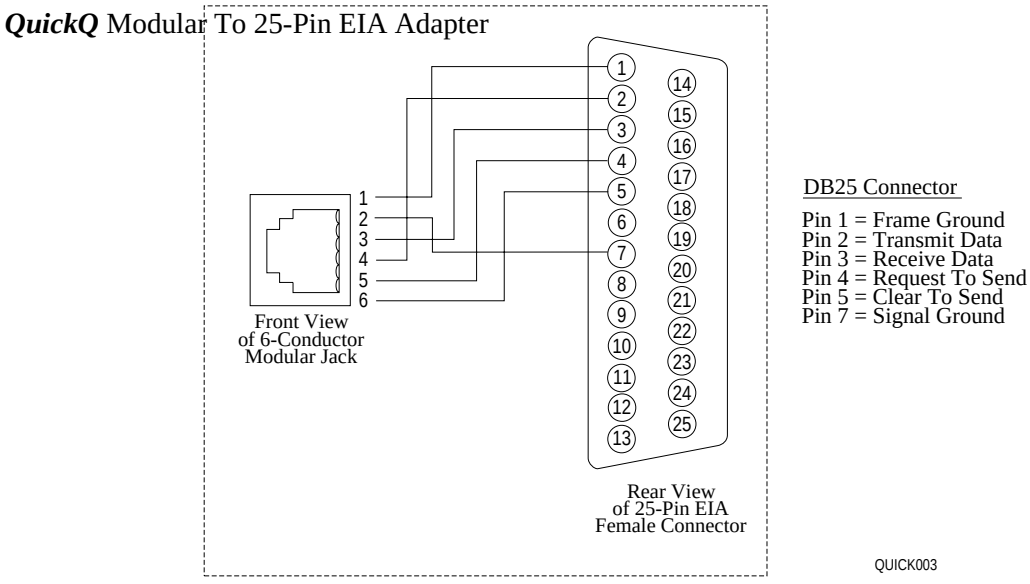


Figure 3-3. Detailing The Kit-Supplied Modular To 25-Pin EIA Adapter

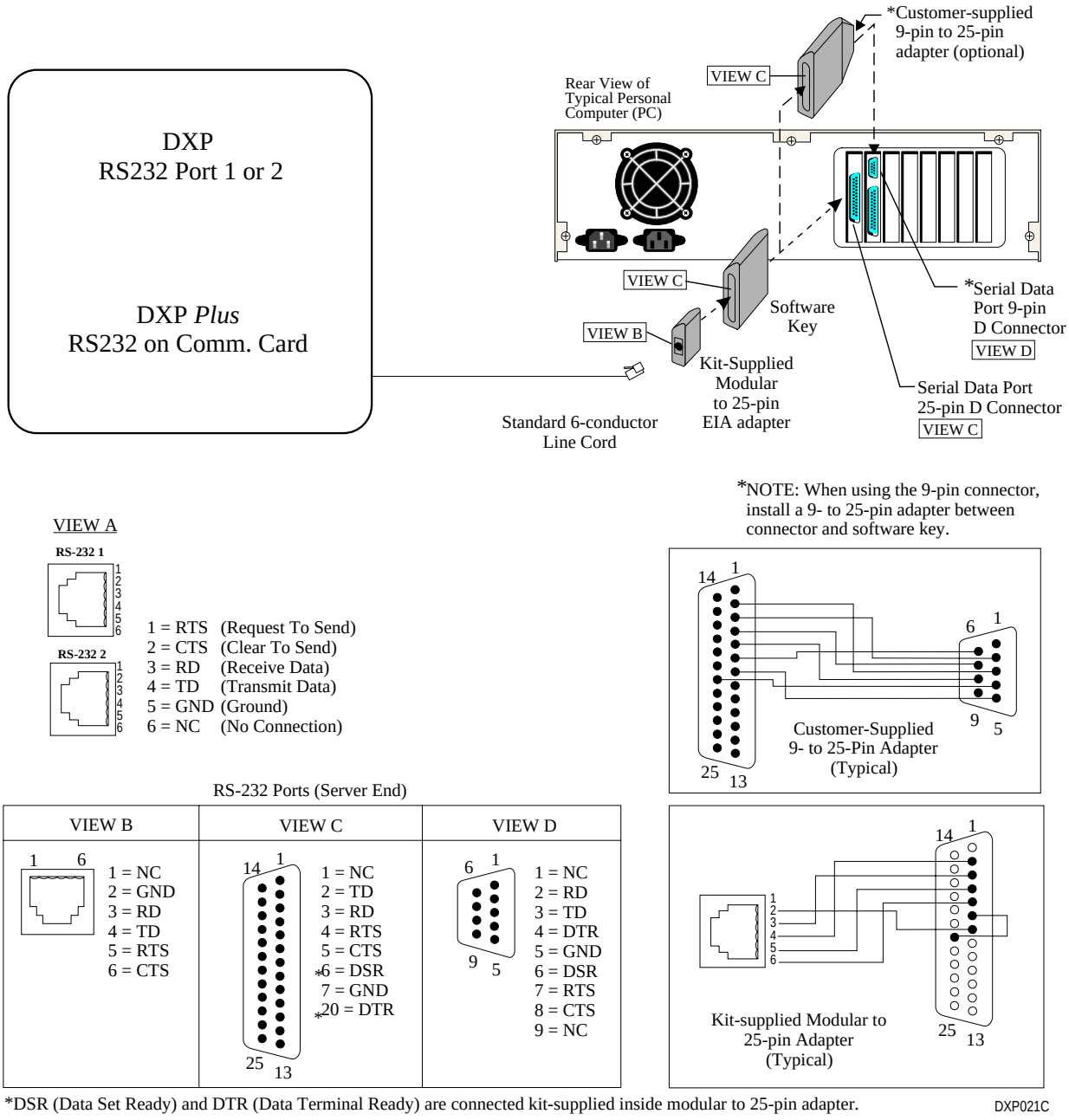


Figure 3-4. Connecting The Personal Computer To The DXP

Connecting The DXP To The DVA

Complete the QuickQ system installation by connecting the DXP to the DVA. You will not need any kit-supplied components; however, you will need a 66-type station connector block and a 25-pair cable.

1. Mount a 66-type station connector block, and connect it to a DXP digital station board.
2. Mount the QuickQ-supplied connector block, and connect its pre-wired cable to the DVA.
3. Use a 25-pair cable to connect the QuickQ connect block to the block that you mounted in step 1.

Wiring The Connector Block

DXP Station Connector Block Clip Terminals	Typical 25-Pair Cable	QuickQ-Supplied Connector Block Clip Terminals	DVA Voice Port	DVA Voice Channel Card
1	white-blue	1	1	1
2	blue-white	2		
3	white-orange	3	2	
4	orange-white	4		
5	white-green	5	3	
6	green-white	6		
7	white-brown	7	4	
8	brown-white	8		
9	white-slate	9	5	2
10	slate-white	10		
11	red-blue	11	6	
12	blue-red	12		
13	red-orange	13	7	
14	orange-red	14		
15	red-green	15	8	
16	green-red	16		
17	red-brown	17	9	3
18	brown-red	18		
19	red-slate	19	10	
20	slate-red	20		
21	black-blue	21	11	
22	blue-black	22		
23	black-orange	23	12	
24	orange-black	24		

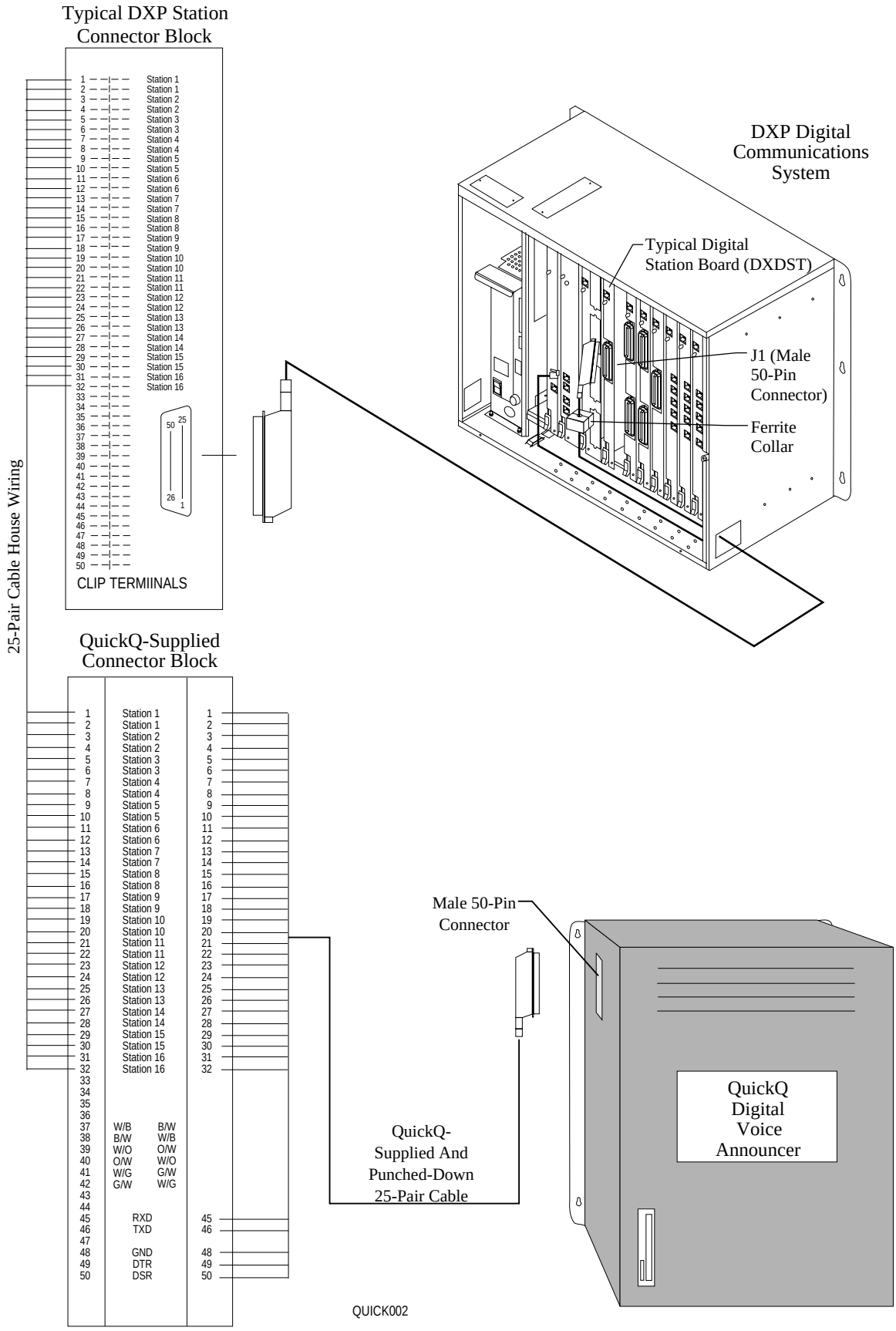


Figure 3-5. Connecting The DXP To The DVA

Connecting The QuickQ PROTECKEY

You must connect the supplied *QuickQ* PROTECKEY to the computer's parallel port. Refer to Figure 3-6 for details.

CAUTION

The system will not function if you fail to connect the QuickQ PROTECKEY.

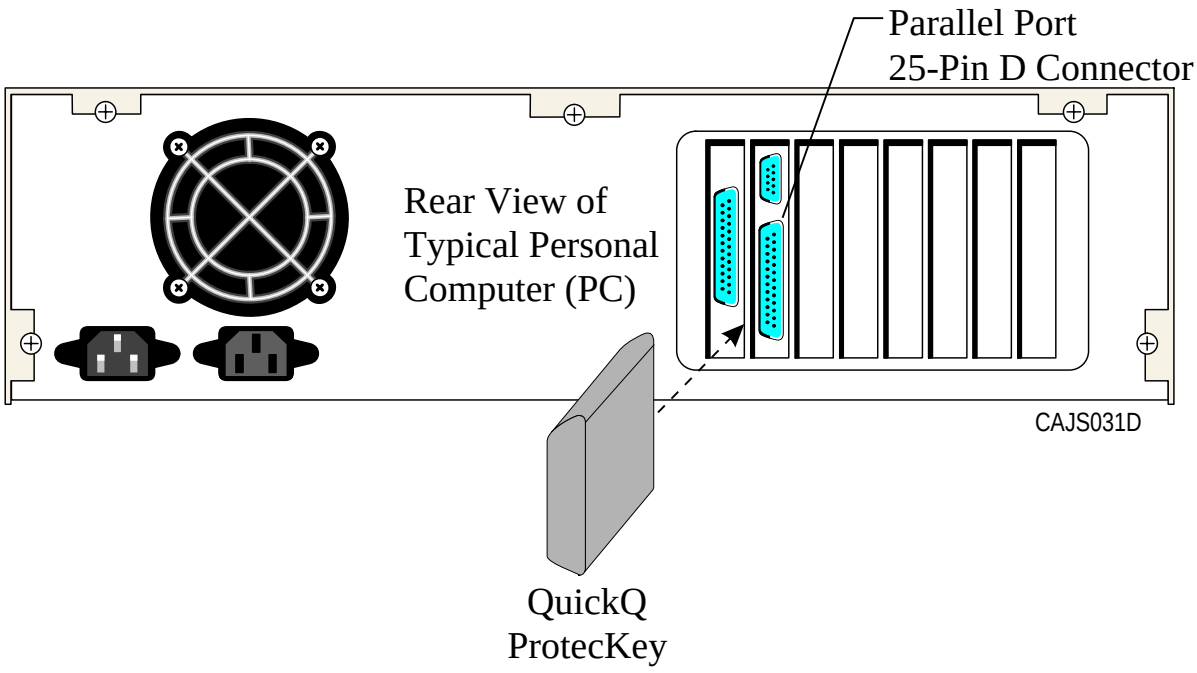


Figure 3-6. Connecting The QuickQ PROTECKEY

Connecting AC Power To The DVA

Before applying power to the DVA check all wiring connections and ensure that you have properly configured the Voice Channel Card as described in Section 6, Reviewing The *QuickQ* DVA Components.

Always employ a dedicated 117VAC 15 AMP circuit, with a third-wire ground, supplied to a non-switched standard electrical outlet (NEMA 5-15R) for the AC power connection. For added equipment protection, connect a plug-in power line surge protector between the power cord and the AC outlet.

Be sure that the DVA is switched off, and connect the AC power per this procedure:

1. plug the female end of the AC power cord into the power supply receptacle located on the left side of the *QuickQ* DVA,
2. plug the male end of the AC power cord into the power line surge protector.

Reviewing The System Interconnection

Compare your system interconnection with the Figure 3-7 illustration.

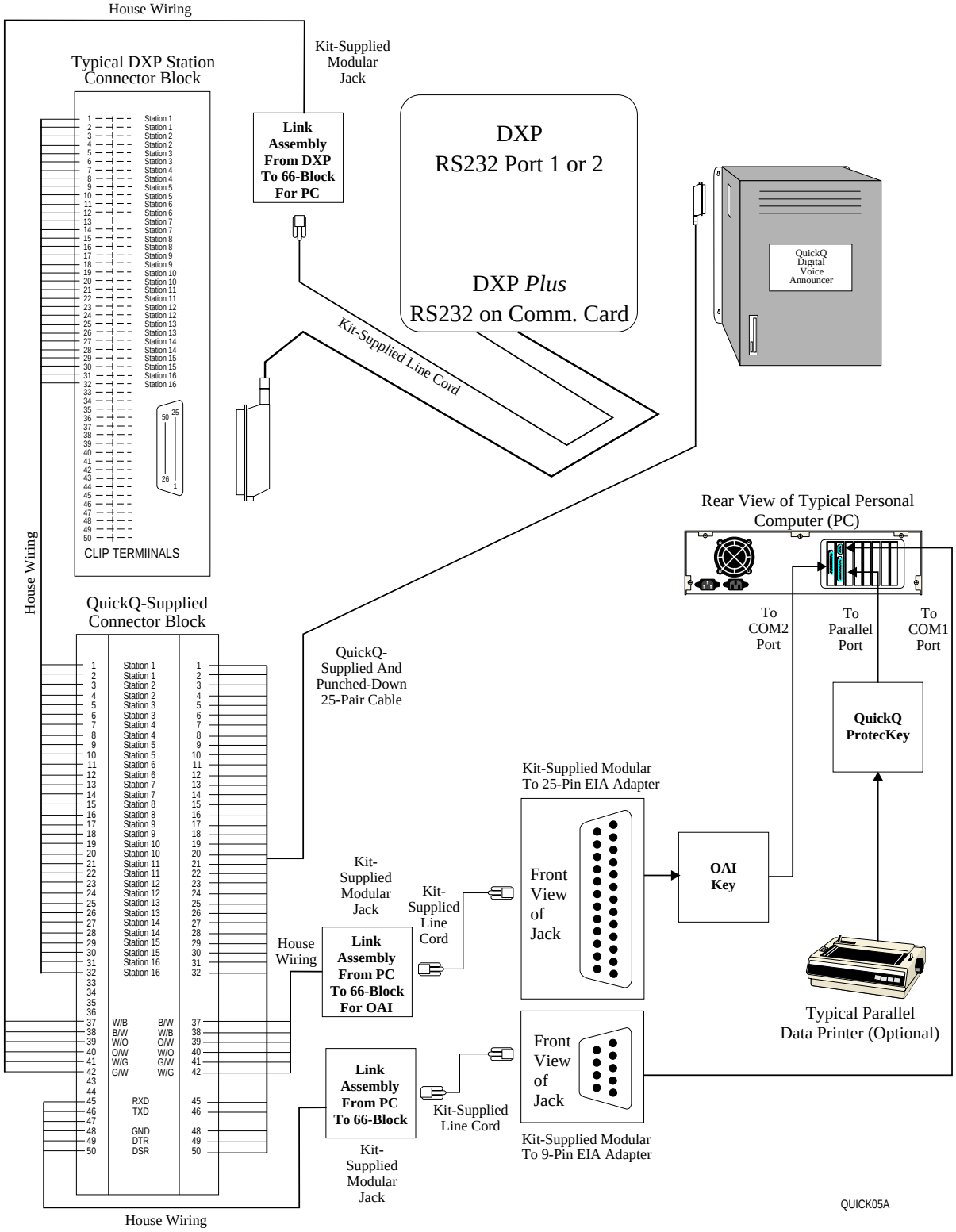


Figure 3-7. Reviewing The System Interconnection

Section 4
Programming The DXP Digital Communications System

You must make certain programming arrangements to ensure that the DXP will work properly with the *QuickQ* DVA. This section details those DXP parameters that you must arrange. Refer to the DXP Video Terminal Programming Instructions for complete programming details. You can find that instruction included in the literature binder that accompanies your DXP digital communications system.

Programming The DXP System Parameters

Feature Name	QuickQ Parameter
Synchronized Ringing	No
Auto Attendant Immediate Transfer	No
Automatic Route Selection	**Disabled**
System Status Reporting	Disabled
Central Message Desk	None
IST Ringing Per Phase	8
Operator Station	Master
Line Disconnect Automatic Camp-On	Disabled
Automatic Station Relocation	**Disabled**
Default Relocation Response	Yes
Day 1—Begin Time	None
Day 1—End Time	None
Day 2—Begin Time	None
Day 2—End Time	None
Night—Begin Time	None
Night—End Time	None
Highlighted Features = Critical Settings	

Programming The DXP Line Parameters

Configure each line with the parameters shown in the table. Program the line names as L001 for line one, L002 for line two, L003 for line three, and so forth until you have named every line that you need for the QuickQ installation. You cannont change these line names.

Feature Name	QuickQ Parameter
Name	**Lnnn**
Type	Loop Start
Disabled	No
Music On Hold	Source 1
Privacy Release	No
SMDR Record	Yes
Cost Incoming	No
—Incoming Cost Delay	No Delay
—Incoming Cost Route	32
Dialing Mode	Tone
Abandon Hold Release	350 Ms
Positive Disconnect Time	2 Sec
Toll Groups	1
DTMF Level	Normal
Disconnect Supervision	**Yes**
Caller ID Active	Yes
ExecuMail ID	
Line Group	1, 16
Highlighted Features = Critical Settings	

Programming The Serial Data Ports

Feature Name	Port	Baud Out	Baud In	Data Bits	Stop Bits	Parity	Flow Control
QuickQ Parameters	**1 ⁂**	**9600**	**9600**	**8**	**1**	**None**	**RTS/CTS**
	2	300	300	7	2	None	None
Highlighted Features = Critical Settings							

⁂ You cannot use ports one or two if you are using the DXP *Plus*.

Programming Class Of Service For Master Channel 1

You can assign any class of service from COS1 through COS32 to the master channels and voice ports; however, reserve the COS that you do assign exclusively for the master channel. Be sure to enter the COS number that you use here as the COS entry on the station programming features for the master channel voice ports.

Feature Name	QuickQ Parameters
Account Code	No
Automatic Hold On Intercom	Yes
Automatic Hold On Lines	Yes
Background Music	No
Call Cost Display	No
Call Forward All	No
Call Forward Busy/RNA	No
Call Forward Personal	No
Call Park Access	1–9
Call Pick-Up	No
Call Waiting	No
Camp-On Originate	No
Camp-On Receive	No
DND Inhibit	No
DND Override	No
Exclusive Hold	No
Executive Override	No
Executive Override Block	No
Idle Line Preference	No
IST Distinctive Ringing	No
LCD Messaging	No
Meet Me Page	No
Message Deposit	No
Message Wait Originate	No
Music On Intercom Hold	No Music
Paging Receive	No
Paging Transmit	No
Ringing Preference	No
Day Route Access	4
Night Route Access	4
Day Restriction Level	1
Night Restriction Level	1
System Speed Dial Groups	1–20
Station Monitoring	No
Directed Station Hold	No
Remote Station Disable	No
Line Answer	1–128 (1-240 for DXP *Plus*)
Line Originate	None
Periodic Line Tone	None
Maximum Call Duration	None
Line Group Access	None
Line Group Queue	No
Line To Line Transfer	Yes
Voice Announce Block	Yes
Internal IST Flash	No
Forced Account Codes	No
Allow Busy Display	No
There are no critical COS feature settings required for the master voice channel.	

Programming Class Of Service For Master Channel 2

You can assign any class of service from COS1 through COS32 to the master channels and voice ports; however, reserve the COS that you do assign exclusively for the master channel. Be sure to enter the COS number that you use here as the COS entry on the station programming features for the master channel voice ports.

Feature Name	QuickQ Parameters
Account Code	No
Automatic Hold On Intercom	Yes
Automatic Hold On Lines	Yes
Background Music	No
Call Cost Display	No
Call Forward All	No
Call Forward Busy/RNA	No
Call Forward Personal	No
Call Park Access	1–9
Call Pick-Up	No
Call Waiting	No
Camp-On Originate	No
Camp-On Receive	No
DND Inhibit	No
DND Override	No
Exclusive Hold	No
Executive Override	No
Executive Override Block	No
Idle Line Preference	No
IST Distinctive Ringing	No
LCD Messaging	No
Meet Me Page	No
Message Deposit	No
Message Wait Originate	No
Music On Intercom Hold	No Music
Paging Receive	No
Paging Transmit	No
Ringing Preference	No
Day Route Access	4
Night Route Access	4
Day Restriction Level	1
Night Restriction Level	1
System Speed Dial Groups	1–20
Station Monitoring	No
Directed Station Hold	No
Remote Station Disable	No
Line Answer	1–128 (1-240 for DXP *Plus*)
Line Originate	None
Periodic Line Tone	None
Maximum Call Duration	None
Line Group Access	None
Line Group Queue	No
Line To Line Transfer	Yes
Voice Announce Block	Yes
Internal IST Flash	No
Forced Account Codes	No
Allow Busy Display	No
There are no critical COS feature settings required for the master voice channel.	

Programming The Master Channel 1 Voice Port Station Features

Port Number	1 (you can use any digital port without a connected telephone)
Port Type	Digital
Port Model	DigiTech 24-Line LCD Speaker-phone

Feature Name	QuickQ Parameters
Personal Intercom	**101**
Name	MASTER 1
Class Of Service (enter COS for master channel)	*****
Speed Dial Sets	3
Idle Line Priority	None
Intercom Hunt List	None
Group Intercom Access	**4201–4264**
Prime Type	No Prime
—Line	1
—Line Group	1
—Intercom	101
Tone First	**Yes**
Call Announce Beeps	1
Default Forward Type	No Forward
—Intercom Forward To:	101
—Forward Type	Personal Calls
Forward Ring No-Answer Ring Busy	No
Direct Ring	None
Delayed Ring	None
Day 1 Ring	None
Day 2 Ring	None
Night Ring	None
Caller ID Ring No-Answer	None
Ring No-Answer Rings	4
Personal Ring tone	1
LCD Contrast	5
Initiate Service Observe	No
Service Observable	No
Day Exception Number	1–3
Night Exception Number	1–3
SOHVA Beeps	6
SOHVA Groups	None
Busy On SOHVA	No
Pick-Up Groups	1
Through-Dialing	No
Single Line TAP	Call Wait Answer
Ring On Busy	Yes
Allow Ringer Off	No
Disabled	No
Consoles Installed	No
Console Ports	None
Programming Port	No
Automatic Attendant Transfer On Busy	**No**
Headset	No
Recall Call Forward	No
Attendant	No
—Alternate Attendant	None
—Overflow Attendant	None
Extended DTMF Dialing	No
Softkeys Setup	No
IST Hold Configuration	No
Transfer Ring Cadence	Cadence 1
Highlighted Features = Critical Settings	

**Use the same unique class of service for the master channel and the voice port.*

Programming The Master Channel 2 Voice Port Station Features

Port Number	2 (you can use any digital port without a connected telephone)
Port Type	Digital
Port Model	DigiTech 24-Line LCD Speaker-phone

Feature Name	QuickQ Parameters
Personal Intercom	**102**
Name	MASTER 2
Class Of Service (enter COS for master channel)	*****
Speed Dial Sets	3
Idle Line Priority	None
Intercom Hunt List	None
Group Intercom Access	**4201–4264**
Prime Type	No Prime
—Line	1
—Line Group	1
—Intercom	102
Tone First	**Yes**
Call Announce Beeps	1
Default Forward Type	No Forward
—Intercom Forward To:	102
—Forward Type	Personal Calls
Forward Ring No-Answer Ring Busy	No
Direct Ring	None
Delayed Ring	None
Day 1 Ring	None
Day 2 Ring	None
Night Ring	None
Caller ID Ring No-Answer	None
Ring No-Answer Rings	4
Personal Ring tone	1
LCD Contrast	5
Initiate Service Observe	No
Service Observable	No
Day Exception Number	1–3
Night Exception Number	1–3
SOHVA Beeps	6
SOHVA Groups	None
Busy On SOHVA	No
Pick-Up Groups	1
Through-Dialing	No
Single Line TAP	Call Wait Answer
Ring On Busy	Yes
Allow Ringer Off	No
Disabled	No
Consoles Installed	No
Console Ports	None
Programming Port	No
Automatic Attendant Transfer On Busy	**No**
Headset	No
Recall Call Forward	No
Attendant	No
—Alternate Attendant	None
—Overflow Attendant	None
Extended DTMF Dialing	No
Softkeys Setup	No
IST Hold Configuration	No
Transfer Ring Cadence	Cadence 1
Highlighted Features = Critical Settings	

**Use the same unique class of service for the master channel and the voice port.*

NOTE: You cannot button-map the group intercom numbers 4201–4264 on any station.

Programming The DVA Station Features

Port * Number	*
Port Type	Digital
Port Model	*Impact* 24-Line LCD Speaker-phone

QuickQ uses 16 DVA stations for system operation. Assign any personal intercom numbers to them that you wish. These personal intercom numbers need not be consecutive numbers; however, they **must be in sets of four and **each set must be from a particular digital station board**.*

Name the DVA stations DVA1 through DVA16 and assign a group intercom access number (from 4265 through 4280) to each DVA station. (For example, assign DVA1 to ext. 4265, DVA2 to ext. 4266, and so forth until you assign DVA16 to ext. 4280)

Feature Name	QuickQ Parameters
Personal Intercom*	*
Name*	*
Class Of Service (enter COS for master channel)	*
Speed Dial Sets	3
Idle Line Priority	None
Intercom Hunt List	None
Group Intercom Access*	*
Prime Type	No Prime
—Line	1
—Line Group	1
—Intercom*	*
Tone First	**Yes**
Call Announce Beeps	1
Default Forward Type	No Forward
—Intercom Forward To:	*
—Forward Type	Personal Calls
Forward Ring No-Answer Ring Busy	No
Direct Ring	None
Delayed Ring	None
Day 1 Ring	None
Day 2 Ring	None
Night Ring	None
Caller ID Ring No-Answer	None
Ring No-Answer Rings	4
Personal Ring tone	1
LCD Contrast	5
Initiate Service Observe	No
Service Observable	No
Day Exception Number	1–3
Night Exception Number	1–3
SOHVA Beeps	6
SOHVA Groups	None
Busy On SOHVA	No
Pick-Up Groups	1
Through-Dialing	No
Single Line TAP	Call Wait Answer
Ring On Busy	Yes
Allow Ringer Off	No
Disabled	No
Consoles Installed	No
Console Ports	None
Programming Port	No
Automatic Attendant Transfer On Busy	**No**
Headset	No
Recall Call Forward	No
Attendant	No
—Alternate Attendant	None
—Overflow Attendant	None
Extended DTMF Dialing	No
Softkeys Setup	No
IST Hold Configuration	No
Transfer Ring Cadence	Cadence 1
Highlighted Features = Critical Settings	

Programming The Supervisor And Agent Station Features

Port * Number	*
Port Type	Digital
Port Model	*Impact* 12- or 24-Line LCD Speaker-phone

Feature Name	QuickQ Parameters
Personal Intercom*	*
Name*	*
Class Of Service	32
Speed Dial Sets	3
Idle Line Priority	None
Intercom Hunt List*	*
Group Intercom Access*	*
Prime Type	**No Prime**
—Line	1
—Line Group	1
—Intercom*	*
Tone First	**Yes**
Call Announce Beeps	1
Default Forward Type	No Forward
—Intercom Forward To:	MASTER
—Forward Type	Personal Calls
Forward Ring No-Answer Ring Busy	No
Direct Ring	None
Delayed Ring	None
Day 1 Ring	None
Day 2 Ring	None
Night Ring	None
Caller ID Ring No-Answer	None
Ring No-Answer Rings	4
Personal Ring tone	1
LCD Contrast	5
Initiate Service Observe	**Yes**
Service Observable	**Yes**
Day Exception Number	1–3
Night Exception Number	1–3
SOHVA Beeps	6
SOHVA Groups	None
Busy On SOHVA	No
Pick-Up Groups	1
Through-Dialing	No
Single Line TAP	Call Wait Answer
Ring On Busy	Yes
Allow Ringer Off	No
Disabled	No
Consoles Installed	No
Console Ports	None
Programming Port	No
Automatic Attendant Transfer On Busy	No
Headset	No
Recall Call Forward	No
Attendant	No
—Alternate Attendant	None
—Overflow Attendant	None
Extended DTMF Dialing	No
Softkeys Setup	No
IST Hold Configuration	No
Transfer Ring Cadence	Cadence 1
Highlighted Features = Critical Settings	+

** Assign any personal intercom numbers to agent and supervisor stations that you wish. Name the agent and supervisor stations as desired (such as, AGENT1, SUPERVS, and so forth). assign any two unique group intercom numbers to the intercom hunt list and group intercom access for each station.*

Button Mapping The Stations

Button Mapping The Master Channel Voice Port Stations And The DVA Stations

Button Designation	Feature Mnemonic	Button Designation	Feature Mnemonic
L01	# # #	L13	# # #
L02	# # #	L14	# # #
L03	# # #	L15	# # #
L04	# # #	L16	# # #
L05	# # #	L17	# # #
L06	# # #	L18	# # #
L07	# # #	L19	# # #
L08	# # #	L20	# # #
L09	# # #	L21	# # #
L10	# # #	L22	# # #
L11	# # #	L23	# # #
L12	# # #	L24	# # #
Ensure that the DVA stations have no lines or features assigned to them (# # # = blank, or unassigned, buttons).			

Button Designation	Feature Mnemonic	Button Designation	Feature Mnemonic
L01	Group Intercom	L13	Headset
L02	Group Intercom	L14	# # #
L03	Line Group 1	L15	# # #
L04	Park Orbit 1	L16	# # #
L05	Park Orbit 2	L17	# # #
L06	Page 1	L18	# # #
L07	# # #	L19	# # #
L08	# # #	L20	# # #
L09	# # #	L21	# # #
L10	# # #	L22	# # #
L11	# # #	L23	# # #
L12	# # #	L24	OAI01 **(QuickQ button)**

Section 5
Setting Up The Personal Computer

Follow the information that Sections 2 and 3 provide for installing and wiring the *QuickQ* system. Then refer to this section to set up the computer hardware and perform the initial programming required for the *QuickQ* system.

Using QuickQ With A Keyboard

You can use either a keyboard or a mouse to access the *QuickQ*. It is a good practice to use the keyboard for programming until you become comfortable using a mouse. For instruction on using a mouse and the *QuickQ*, refer to Appendix 1 page A1-1.

There are five keys that can be used in place of a mouse.

TAB Press to highlight a word (or item) and move the cursor. Press Shift-TAB to move the highlight backward.

ENTER Press when you require a specific word (or item) once you have highlighted it. Press to close a message or error window.

ESC Press to close a message or error window or to close the current window.

ARROW Press to move the cursor.

ALT Press and hold while typing an underlined letter to open a window. For example, to access the sign-in menu you can press and hold ALT and then type S. The ALT key will move the control from a window back to the menu title bar without closing the window.

F1 Press to cause a help window to appear.

CAUTION

Do not press PRINT SCREEN or PAUSE while using *QuickQ*. Pressing either of these keys could cause *QuickQ* to stop operating.

Performing Initial Programming For QuickQ

If you switch the *QuickQ* on without having first programmed the voice port extension numbers into the *QuickQ* software, an error window will open with an appropriate error message.

See Figure 5-1 for an illustration of this window. Press the ENTER key to continue with the initial programming of *QuickQ*. Press ESC to close *QuickQ Status.*

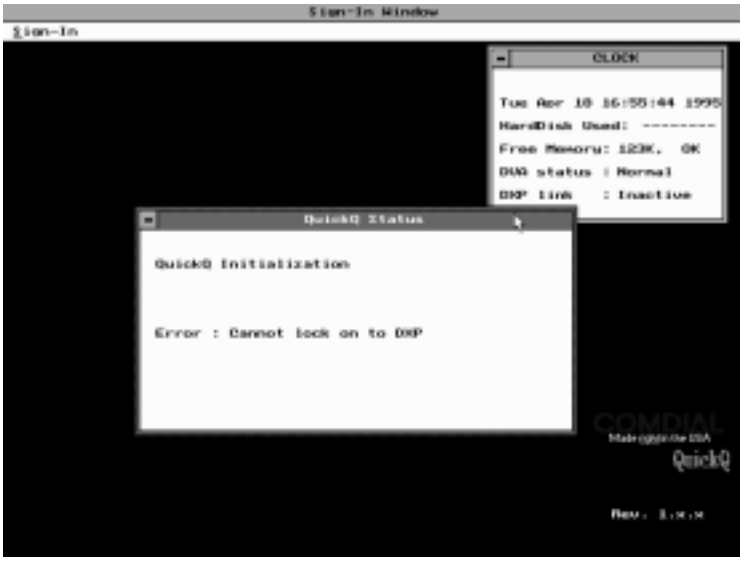


Figure 5-1. Viewing The Error Window

Signing Into The Technician Access Level

Use the following procedure to access *QuickQ*'s technician programming level.

1. Select the Sign-in menu bar option. Hold down the **ALT** key and press the **S** key or press the **ENTER** key with *Sign-in* highlighted. The system access window will open with the highlight in the ID# box, a default value of 100 will also be in the ID# box. See Figure 5-2 for an illustration of this.

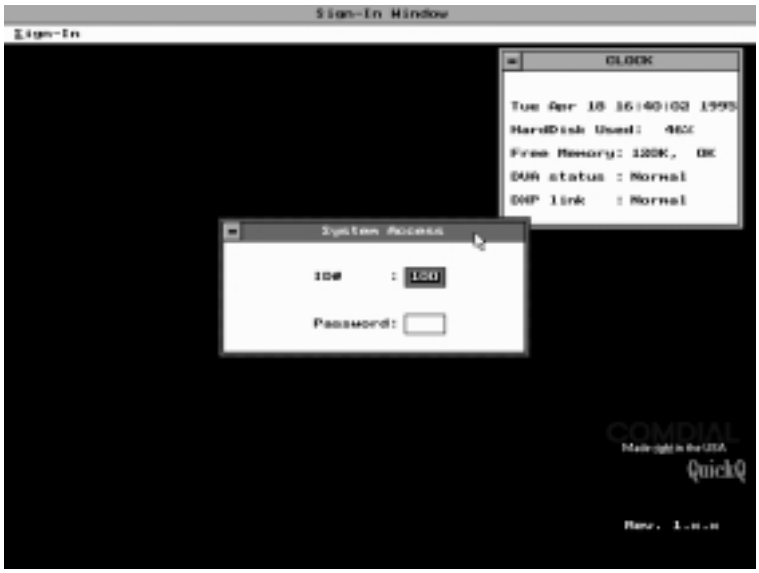


Figure 5-2. Viewing The System Access Window

2. Type the technician's ID number (default 832) and press the **ENTER** key. The highlight will move to the *password* box.
3. Type the technician's password (default 832) and press the **ENTER** key. The *supervisor/manager sign-in* window will appear (see Figure 5-3).

NOTE: *The system hides the password digits when you type them.*



Figure 5-3. Viewing The Supervisor/Manager Sign-In Window

4. Place the highlight on the line with *agent title technician* and press the **ENTER** key. The screen display changes to show the technician window and the menu bar shows a series of four options (see Figure 5-4). Selecting *agent title manager* will allow access to the manager window. Further description shown in System Manager's Guide.

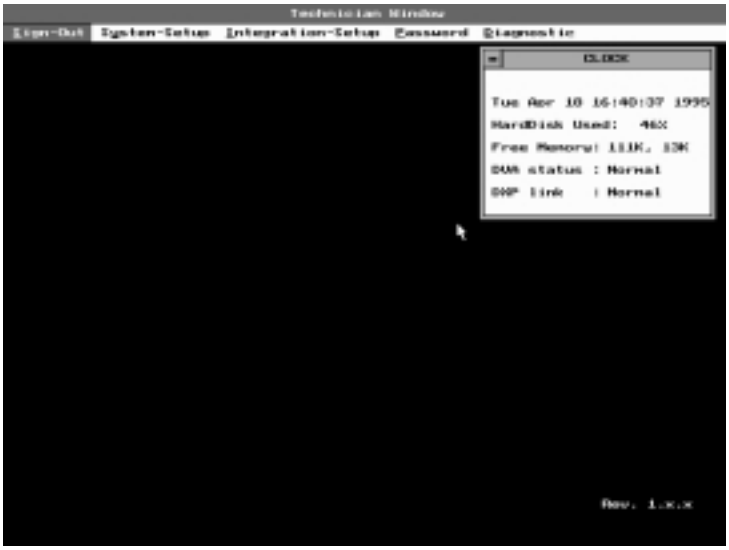


Figure 5-4. Viewing The Technician Window

Programming The OAI Number And Master Channel

The master channel refers to a DXP digital station port that you have reserved for call processing control.

1. After signing into the *technician access* level, select the *system-setup* option. Hold down the **ALT** key and press the **Y** key or highlight *system-setup* and press **ENTER**. The *system-setup* options will open. See Figure 5-5 for details.

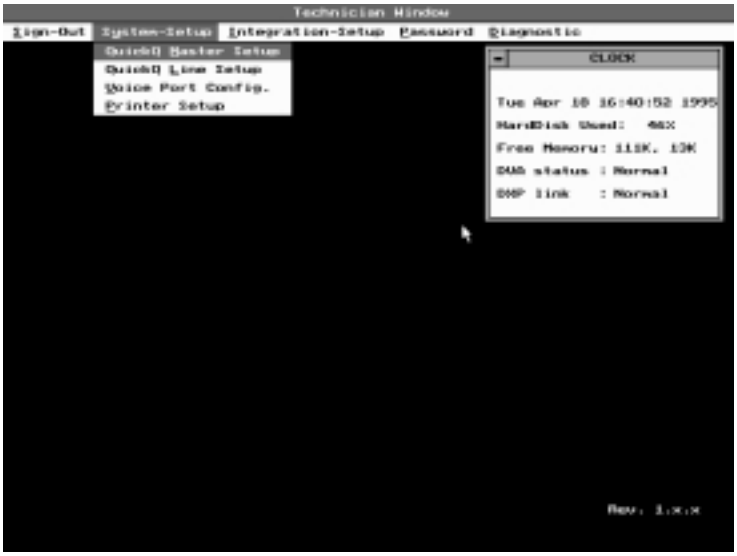


Figure 5-5. Viewing The System-Setup Window

2. Select the *QuickQ master setup*. Hold down the **ALT** key and press the **M** key or press the **ENTER** key with *QuickQ master setup* highlighted. Enter the intercom number of an **unassigned** DXP digital station port, then press the **ENTER** key. For the Master 2 extension, enter the intercom number of a second **unassigned** DXP digital station port. The cursor will advance to the *OAI code* option. Select the OAI code to use for *QuickQ* (01—64). The number that you use here must match the number that you assigned to the agent and supervisor's telephone in station class of service button mapping.
3. To save the changes, press and hold the **ALT** key and press the **S** key. The *save changes?* window will open with a *Yes No* option.
4. To select the *yes* option, use the **TAB** key or the left arrow key to highlight *yes* and press the **ENTER** key.

Adding Lines To QuickQ

The system divides its add option menu into four catagories. These catagories include the following items:

(1) Line Name—ACD line names can be up to seven characters in length. The names are displayed on the LCD of the agent's telephone while that station is logged into the *QuickQ* system.; otherwise, the DXP line name shows in the display. *QuickQ* call reports use the ACD line name while SMDA/SMDR reports use the DXP line name.

(2) Group—This is the ACD group that the system associates with the lines. There are 16 groups available plus an External Transfer Lines selection (Ex Trans.). The Ex Trans. selection allows the proprietary voice mail system or an operator to transfer lines to the QuickQ system. Transfers must be to a group intercom associated with a desired ACD group. To ensure proper operation, you must give the master voice channels access to the group intercoms being used. The *QuickQ* system associates particular group intercom numbers with each of the 16 ACD groups. That association is as shown on the following chart. The system only supports the use of unscreened transfers.

Gp 1	Gp 2	Gp 3	Gp 4	Gp5	Gp 6	Gp 7	Gp 8	Gp 9	Gp10	Gp 11	Gp 12	Gp 13	Gp 14	Gp 15	Gp 16
4201	4202	4203	4204	4205	4206	4207	4208	4209	4210	4211	4212	4213	4214	4215	4216
4217	4218	4219	4220	4221	4222	4223	4224	4225	4226	4227	4228	4229	4230	4231	4232
4233	4234	4235	4236	4237	4238	4239	4240	4241	4242	4243	4244	4245	4246	4247	4248
4249	4250	4251	4252	4253	4254	4255	4256	4257	4258	4259	4260	4261	4262	4263	4264

(3) Subgroup—This catagory usually remains at its default value of LNGP1 unless the site has several line types (such as WATS FX, Local) and you must differentiate between them.

(4) Line Number—This is the DXP line port. enter it in a four-character format (for example, line 1 = L001).

Use this procedure to add lines to the Q*uickQ* system.

1. Open the *technician access* level and select the system-setup option. Either press and hold the **ALT** key and press the **Y** key or highlight *system setup* and press the **ENTER** key. The *system-setup* options will open.
2. To select the *QuickQ line setup*, press the down arrow key to highlight *QuickQ line setup* option and press the **ENTER** key. The *QuickQ line setup* window will open (see Figure 5-6).

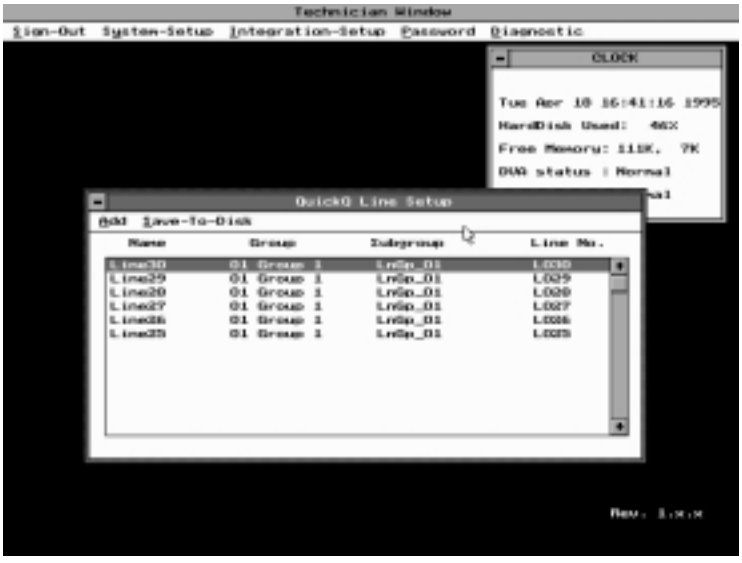


Figure 5-6. Viewing The QuickQ Line Setup Window

3. To select the *add* option, press and hold the **ALT** key and press the **A** key. The *QuickQ line setup ADD* window will open with the highlight in the *line name* box. See Figure 5-7. Type the name for the line (limited to 7 characters) and press the **ENTER** key.

NOTE*: The line names must be unique. The system uses this name in the reports and displays it on the ACD agents telephones when QuickQ presents the line to the telephone. These line names do not affect the DXP names for the lines.*

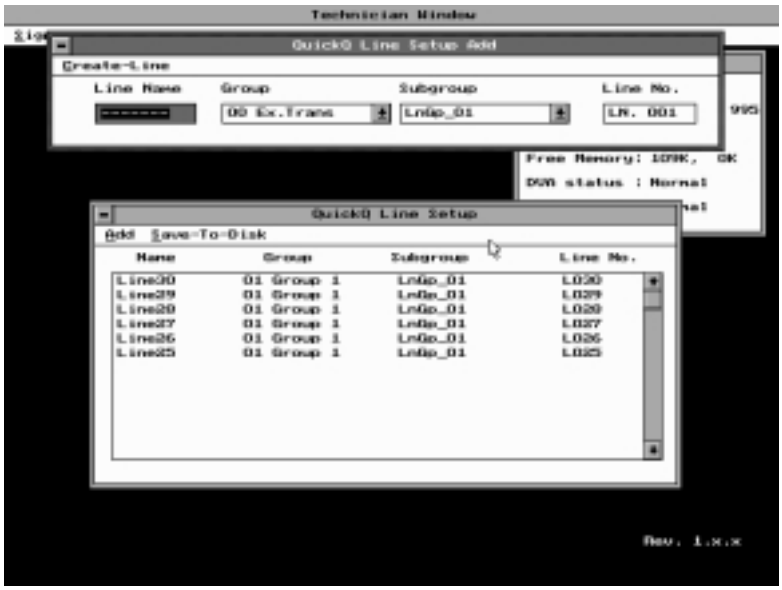


Figure 5-7. Viewing The ACD Line Setup Add Window

4. To select the line's assigned ACD group, press the up or down arrow key to change between the groups, and press the **TAB** key to select the group required. Alternately, you can press the **ENTER** key to make the list of the groups appear, use the arrow keys to highlight the selection, press the **ENTER** key, and press **TAB** to select. the group.
5. To select the line's ACD line subgroup, press the up or down arrow key to change between the subgroups, and press the **TAB** key to select the subgroup required. Alternately, you can press the **ENTER** key to make the list of the subgroups appear, use the arrow keys to highlight the selection, press the **ENTER** key, and press the **TAB** key to select the subgroup.
6. Highlight the Line No. box, enter the three-digit number for the DXP line port where you have physically connected the line, and press the **ENTER** key. Make sure that the line number matches the name you assinged in the DXP.
7. To save the line programming select the create-line option, press and hold the **ALT** key and then press the **C** key. The create new line? window will open. Highlight Yes in this window and press the **ENTER** key to save the line programming.
8. If a line is assigned to a line subgroup that does not exist, *QuickQ* will open the create new line-subgroup? window. Highlight Yes and press the **ENTER** key to save a new line subgroup.
9. To close the *QuickQ* line setup ADD window press the **ESC** key.
10. Press and hold the **ALT** key and press the **S** key to save programming to the hard drive. Select YES when the Save Line Setup? window opens.

NOTE*: The Save_to_Disk will enable the line if the system is active.*

Deleting Lines From QuickQ

Use the following procedure to delete line from the QuickQ system.

1. Sign into the *technician access* level and select the *system-setup* option. Either press and hold the **ALT** key and press the **Y** key or highlight *system-setup* and press the **ENTER** key. The *system-setup* options will open.
2. To select the *QuickQ* line setup, press the arrow key to highlight *QuickQ line setup* and press the **ENTER** key. The *QuickQ line setup* window will open.
3. To select the ACD line that you wish to delete, press the ALT key to highlight the line, press the arrow keys to highlight the line to be deleated, and press the **ENTER** key. The *edit QuickQ line setup* window will open (see Figure 5-8).
4. To delete the selected line, press and hold the **ALT** key and press the **D** key. The *delete line?* window will open. Highlight *Yes* and press the **ENTER** key to delete the line.
5. Press and hold the **ALT** key and then press the **S** key to save programming to the hard drive. Select YES when the Save Line Setup? window opens.

***NOTE**: If line is currently active, system will not delete line. When you delete a line, exit and re-enter the QuickQ program. This action makes the change affective.*

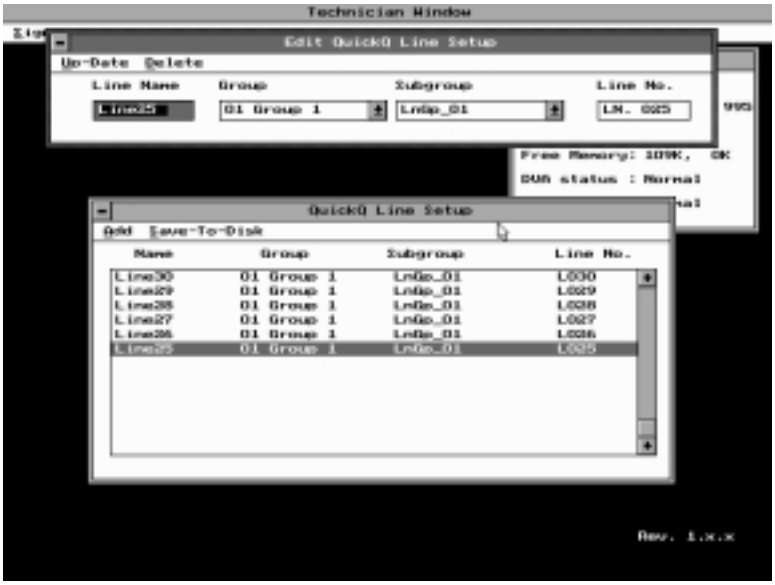


Figure 5-8. Viewing The Edit QuickQ Line Setup Window

Moving The QuickQ Lines

Use the following steps to move ACD lines from one group to another group or from one line subgroup to another line subgroup.

1. Sign into the technician access level and select the system-setup option. Either press and hold the **ALT** key and press the **Y** key or highlight *system-setup* and press the **ENTER** key. The *system-setup* options will open.
2. To select the *QuickQ line setup*, press the arrow key to highlight *QuickQ line setup* and press the **ENTER** key. The *ACD line setup* window will open.
3. To select the ACD line that you wish to move, press the ALT key to highlight the line, press the arrow keys to highlight the line to be moved, and press the **ENTER** key. The *edit QuickQ line setup* window will open (see Figure 5-8).
4. To move the selected line to a different group, press the **TAB** key once to advance the highlight to the *group* column. Press the arrow keys to change between the groups. Press the **TAB** key to select the group required. Alternately, you can press the **ENTER** key to display the list of the groups, use the arrow keys to highlight the required selection,. press the **ENTER** key, and press the **TAB** key to select the group required.
5. To move the selected line to a different line subgroup, press the **TAB** key once to advance the highlight to the *subgroup* column. Press the arrow keys to change between the subgroups. Press the **TAB** key to select the subgroup required. Alternately, you can press the **ENTER** key to display the list of the subgroups, use the arrow keys to highlight the required selection,. press the **ENTER** key, and press the **TAB** key to select the line subgroup required.
6. To save the line programming select the *up-date* option, press and hold the **ALT** key and then press the **U** key. The *save changes to line?* window will open. Highlight *Yes* in this window and press the **ENTER** key to save the line changes.
7. Press and hold the **ALT** key and then press the **S** key save programming to the hard drive. Select YES when the *save line setup?* window opens.

***NOTE**: You cannot use this procedure to change the line number. To change a line number, delete the line with the current number and then add the line with a new line number. When you make a change to the program, exit and re-enter the QuickQ program. This action makes the change affective.*

Programming The QuickQ Voice Ports

The following steps allow you to program the voice port information that *QuickQ* requires to control the voice ports.

1. After you have opened the technician access level, select the ***system-setup*** option. Press and hold the **ALT** key and press the **Y** key or highlight *system set-up* and press the **ENTER** key. The *system-setup* options will open.

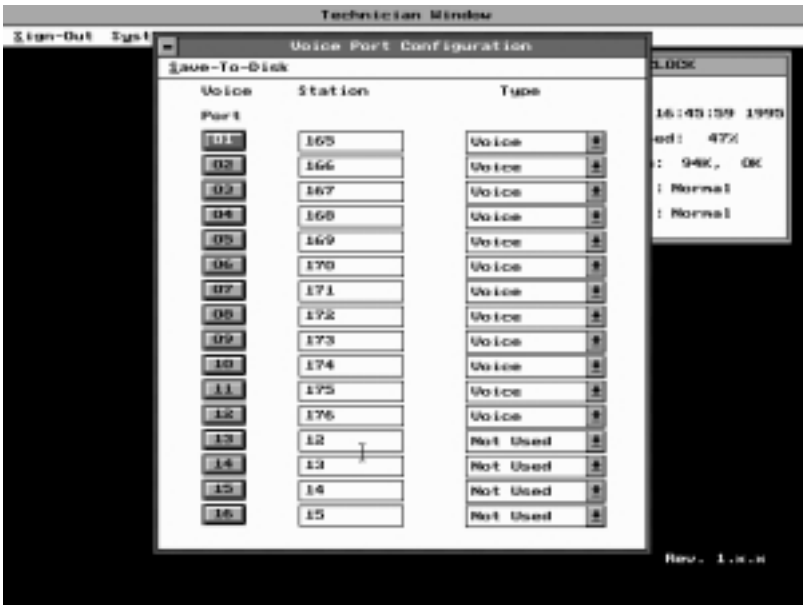


Figure 5-9. Viewing The Voice Port Configuration Window

2. To select the *voice port configuration* option, press the up or down arrow key to highlight *voice port config.*, then press the **ENTER** key. The *voice port configuratio*n window will open (see Figure 5-9).
3. Press the **TAB** key to highlight the box for *voice port 01* under the *station* column. Enter the intercom number for the first voice port and press the **ENTER** key. The highlight will now be under the *type* column.
4. To change between the *not used* and *voice* option, press the up or down arrow key. Press the **TAB,** key to select the option required. Alternately, press the **ENTER** key and the *not used* and *voice* options will appear. Use the up and down arrow keys to highlight the selection required and press the **ENTER** key. Press the **TAB** key to select the option required.

***NOTE**: Not used disables the voice port and voice enables the voice port.*

5. **Use the TAB** key to advance to the next voice port to be set up. Repeat steps 4 and 5 as required.
6. After you have set up all the voice ports used in *QuickQ*, save the programming. Press the **ALT** key and the **S** key to save programming to the hard drive. The *save voice port configuration?* window will open with a *Yes No* option.
7. Press the **TAB** key to select the *yes* option or press the left arrow key to highlight *yes* and press the **ENTER** key.

Programming The QuickQ Printer Information

Use the following steps to program the information required by QuickQ to allow it to print to the data printer.

1. After you have opened the technician access level, select the *system-setup* option. Hold down the A**LT** key and press the **Y** key or highlight the system set-up and press the **ENTER** key. The *system-setup* options will open.

CAUTION

To ensure reliable printout results, only use those data printers that the menu lists. Data printers other than the ones listed on the menu may not interface properly with the *QuickQ* software.

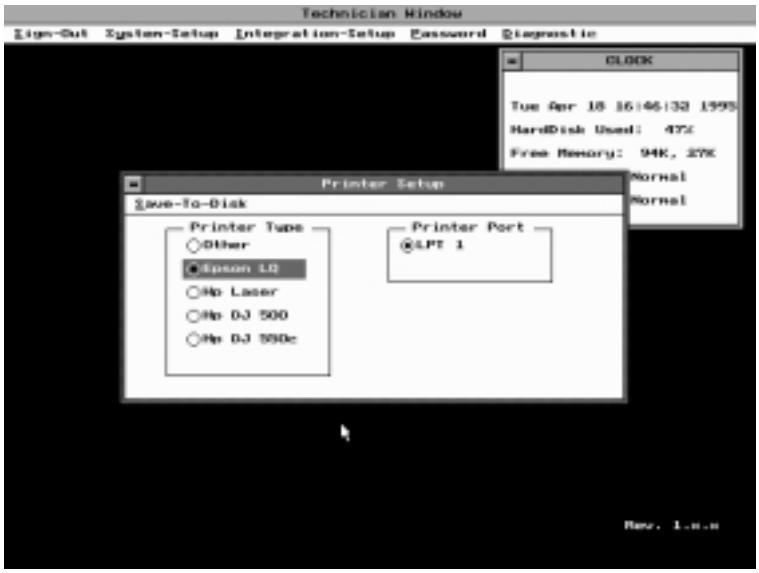


Figure 5-10. Viewing The Printer Setup Window.

2. To select the *printer setup* option, press the up or down arrow key to highlight the *printer setup* option and press the **ENTER** key. The *printer setup* window will open with the highlight under the *printer type* selections. See Figure 5-10 for details.
3. To select the *printer type*, press the up or down arrow keys to highlight required printer and press the **TAB** key to select it. The highlight will move to the *printer port* selections.
4. To select the *printer port*, press the up or down arrow keys to highlight the required port and press the **TAB** key to select it. The highlight will move back to the *printer type* selections.
5. To save the printer parameters, press and hold the **ALT** key and press the **S** key. The *save printer configuration?* window will open with a *Yes No* option.
6. To select the *Yes* option, either press the **TAB** key or press the left arrow key to highlight *Yes* and press the **ENTER** key.

Programming The External Overflow Extensions

You can select up to four DXP personal or group intercom numbers to accept redirected unanswered calls. These numbers must be intercom numbers that are not part of the *QuickQ* ACD group assignments. These overflow extensions accept overflow calls from all 16 ACD groups. External overflow is associated with the inter group overflow feature discussed in GCA70-271, *System Manager's Guide*. That feature causes a call to overflow within a group a maximum of four times. The forth overflow is to the extension numbers that you set with this external overflow feature. With that, further call processing occurs outside the *QuickQ* environment.

1. After you have opened the *technician access* level, use the arrow keys to highlight the *integration-setup* option, and press the **ENTER** key to select the feature.
2. The display highlights the *external overflow* selection. Press the **ENTER** key to select the feature.
3. To assign the *overflow extension*s, press the **TAB** key to select the desired overflow extension, and type the intercom number. Repeat this procedure until you have entered all desired overflow extensions.
4. To save the overflow extension parameters, press and hold the **ALT** key and press the **S** key. The *save overflow extension?* window will open with the *Yes No* option.

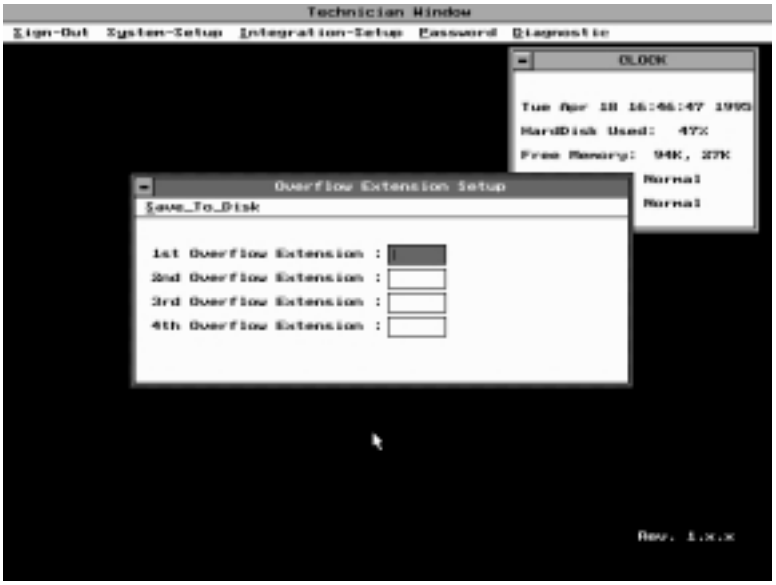


Figure 5-11. Viewing The Overflow Extension Window

Detailing The QuickQ Batch Files

This section details several batch files that are crucial to QuickQ operation.

The contents of the **CONFIG.SYS** file are shown in the following list.

```
DEVICE=C:\QEMM\DOSDATA.SYS
DEVICE=C:\QEMM386.SYS FRAME=NONE RAM NOEMS
DEVICE=C:\QEMM\DOS-UP.SYS @C:\QEMM\DOS-UP.DAT
DOS=HIGH
FILES=40
SHELL=C:\QEMM\LOADHI.COM /R:2 C:\DOS\COMMAND.COM C:\DOS\  /P
BUFFERS=40,0
BREAK=ON
```

The contents of the **AUTOEXEC.BAT** file with Close-Up software are shown in the following list.

```
@echo off
prompt $p$g
PATH C: \DOS;C:\;C:\quickq;C:\qemm;
loadhi c: \mouse\mouse
loadhi c:\closeup6\chostl comx combase=3e8 comirq=5 Noterm

cd\quickq
delay 120

IF ERRORLEVEL 1 GOTO EXIT
quickq

:EXIT
```

The contents of the **AUTOEXEC.BAT** file without Close-Up software are shown in the following list.

```
@echo off
prompt $p$g
PATH C: \DOS;C:\;C:\quickq;C:\qemm;
loadhi c: \mouse\mouse
REM loadhi c:\closeup6\chostl comx combase=3e8 comirq=5 Noterm

cd\quickq
delay 120

IF ERRORLEVEL 1 GOTO EXIT
quickq

:EXIT
```

The contents of the **QUICKQ.BAT** file are shown in the following list:

```
@ECHO OFF
REM QuickQ program
:begin
acd /c2 /v
if errorlevel 2 goto data
if errorlevel 1 goto exit
scandisk c: /autofix /nosummary
datechk
if errorlevel 1 goto month1
goto month0
:month1
defrag c: /f
:month0
booting
goto begin
:data
echo Restoring data files.
copy a:*.dat
if exist *.bak del *.bak
goto begin
:exit
scandisk c: /autofix /nosummary
```

Section 6
Reviewing The QuickQ DVA Components

This section provides information on the components within the Digital Voice Announcer (DVA).

Reviewing The DVA Chassis Components

The components shown in Figure 6-1 are the standard components within the chassis and, in most cases, you would not be change them in the field.

DVA Motherboard
This is the system processing device. The *QuickQ* DVA's task of playing and recording announcements are controlled by the DVA motherboard. The announcements are stored digitally on the DVA motherboard in the Random Access Memory (RAM). The program that controls the DVA resides in the program chips on the motherboard.

IDE Controller
The IDE Controller Card is plugged into the DVA motherboard. This card provides the interface between the DVA motherboard and the computer's RS-232 serial communication link and also provides the control on the Floppy Back-up.

Floppy Back Up
The floppy back up is used to store the digital announcements on a 3 1/2" 1.44 Megabyte (MB) floppy disk in the case of a power failure to the DVA. The DVA automatically restores messages from the floppy disk upon power-up.

Power Supply
The power supply converts AC line voltage to DC. It provides the proper voltage to the DVA motherboard and floppy back up.

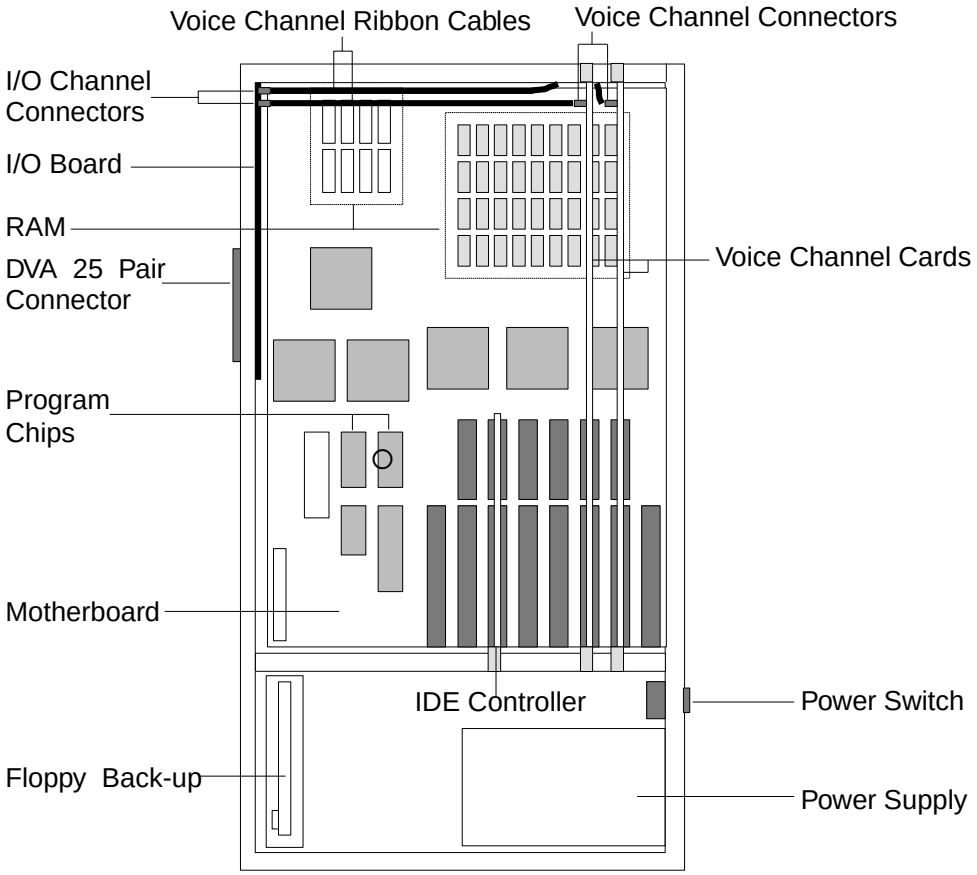


Figure 6-1. Reviewing The QuickQ Digital Voice Announcer

Reviewing The Voice Channel Card

The voice channel card (Figure 6-2) is designed with four digital recording and playback channels. Each channel includes circuitry that directly interfaces with a DXP digital station port. The DVA can hold a maximum of four voice channel cards. Since each voice channel card provides four voice channels, the system capacity is a maximum of 16 voice channels.

The voice channel card connects to the I/O Board through a voice channel ribbon cable. You must connect all four voice channels to station ports from the same DXP station board, and you must connect them in sequence. This means that you can not skip a channel. If you need to add or replace a voice channel card, you must turn the power off while you make the installation.

By changing the card select jumper J2 and J3 (Figure 6-3), you can select the different voice channels (see Table 6-1 for details).

Example: If you set the jumpers for CARD 0, the first of four voice channels becomes Voice Channel 1. This corresponds to voice channel 1 on the I/O Board. If you set the jumpers for CARD 2, the first of four voice channels becomes Voice Channel 9 on the I/O Board.

Card	Card Select Jumper		Voice Channel
	J2	J3	
0	0	0	1
	0	0	2
	0	0	3
	0	0	4
1	0	1	5
	0	1	6
	0	1	7
	0	1	8
2	1	0	9
	1	0	10
	1	0	11
	1	0	12
3	1	1	13
	1	1	14
	1	1	15
	1	1	16

Table 6-1. Selecting The Voice Channel

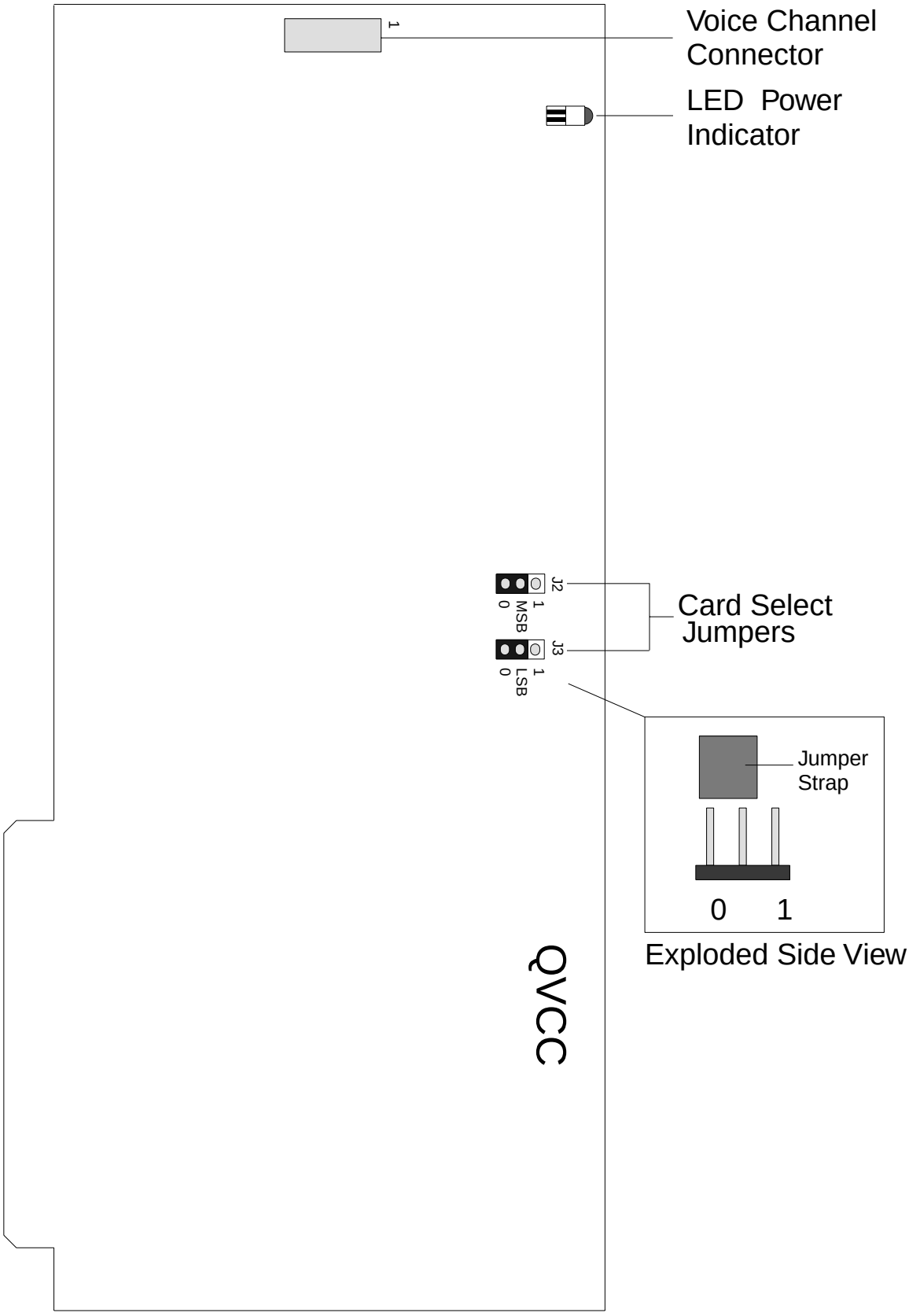


Figure 6-2. Reviewing The QuickQ Voice Channel Card

Reviewing The I/O Board

The I/O Board (Figure 6-3) provides both the I/O interface from the voice channel cards to the DXP and the RS-232 serial communication link to the computer through a male 50-pin connector. There is lightning surge protection built in the I/O board to protect the DVA components.

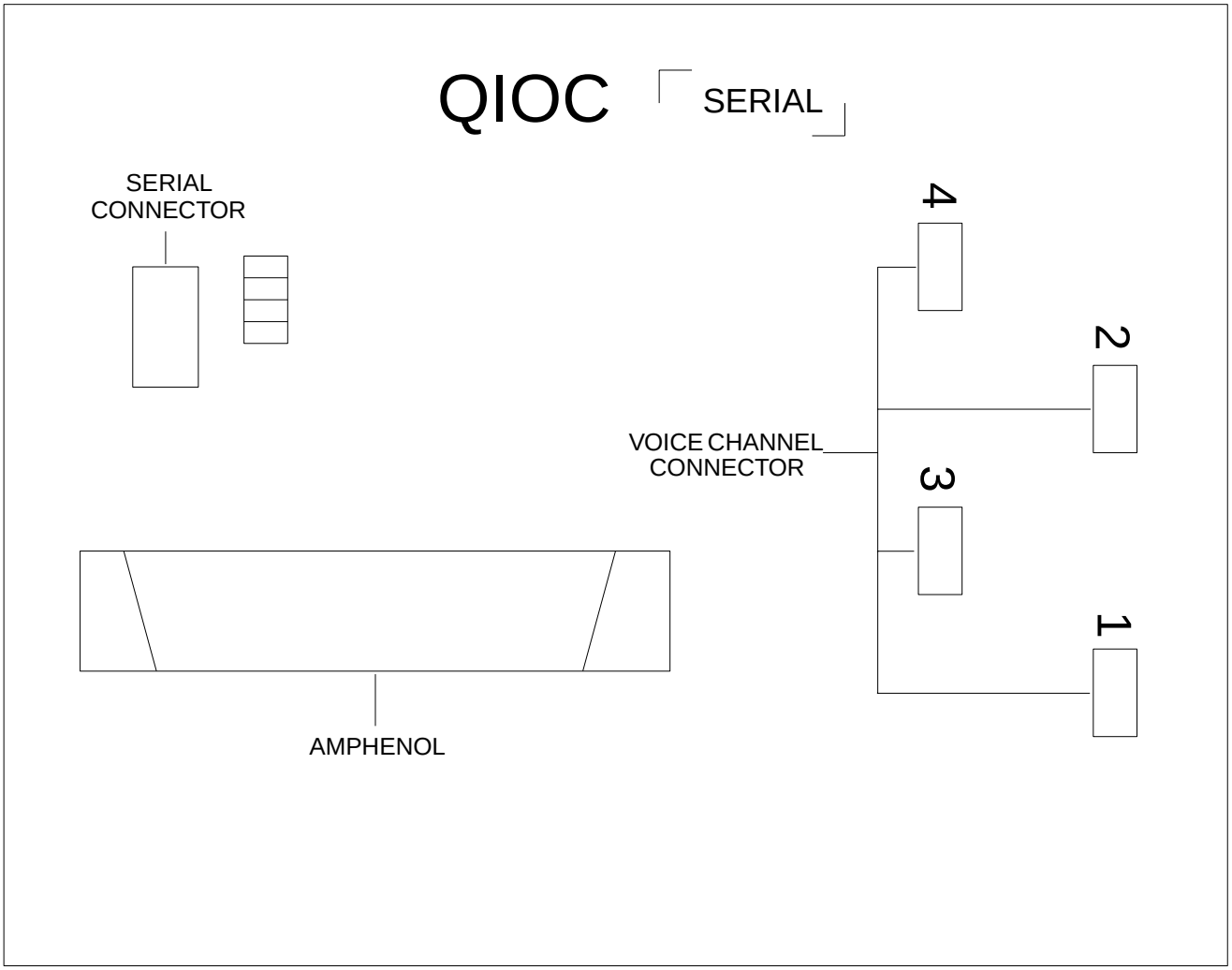


Figure 6-3. Reviewing The QuickQ I/O Board

Section 7
Testing And Troubleshooting

This section provides the basic test procedure and troubleshooting information for the *QuickQ* ACD hardware and software installation

Testing The DVA Installation

The following paragraphs provide the testing and troubleshooting information for the DVA during installation.

Testing Voice Channel Cards

Make sure the voice port stations that are connected to the voice channels are programmed properly.

When you first switch on the computer, the message *QuickQ Initialized. All components acquired. OAI Code* must appear to indicate that *QuickQ* is enabled.

From any DXP telephone, press the ACD key (the programmed OAI button arranged for this purpose) then dial ✻✻832 (✻✻TEC). This action enables the technician's program.

The telephone will show the following displays:

Test	
Voice	Logout

Logout = leave ACD program
Voice = test voice channel

Voice Port:	
	Quit

Voice Port = voice port channel to be tested
Quit = stop the test

Message 1		
REC	PLAY	Quit

REC = record test message 1. (Listen for tone that indicates start of recording.)
Quit = stop the test

Recording	
	STOP

STOP = stop recording (Listen for tone that indicates stop recording.)

You can play a recorded message to verify that a voice card is functioning properly.

Message 1		
REC	PLAY	Quit

PLAY = play message 1

Playing	
	STOP

Record and play back a message at each voice channel of every voice channel card.

Examining Typical Problems

Problem 1: When selecting VOICE to test voice port a message, you see the following display:

Voice Port N/A	
Voice	Logout

This message appears either if a voice port card is not initialized properly or if the voice port selected does not exist. Check the *QuickQ* program (message channel under system programming) to see if the voice port is an active.

Problem 2: When selecting VOICE to test voice port a message, you see the following display:

PC link N/A	
	Logout

This message appears when the RS-232 serial communication link is lost. Check the DVA to see if it is powered on and check all connections between the PC and the DVA.

NOTE: The message recording and playback test verifies all components of the announcement channel. If the voice port passes these tests, no other voice port tests are required.

Testing The QuickQ Software

This discussion provides information on typical software related problems and error messages.

During Initial QuickQ Programming

This paragraph discusses the problems that you may encounter during the initial QuickQ programming.

Examining Typical Problems

Problem 1: After you have entered the ID# in the Sign In window, the error message Invalid ID# appears.

Solution: Be sure the ID# is between 100 and 999. Press the ENTER key to close the error message window. Use the backspace key to delete previously entered ID# digits, re-type the ID#, and press the ENTER key.

Problem 2: After you have entered the proper ID# and password, the system access window will not open.

Solution: You may have entered an extra digit into the ID# or password. Press the ESC key to close the Sign In window and clear the ID# and password. Re-open the Sign In window, re-enter the ID#, and press the ENTER key. Then re-type the password and press the ENTER key.

During QuickQ Operation

When *QuickQ* is in operation, you have troubleshooting utilities located at the *Technician Access* level. There are four utilities located under the diagnostics selection. They are the *enable QuickQ status*, the *agent status*, the *line status*, and the *voice port status*.

Examining The Enable QuickQ Status Utility

The *enable QuickQ status* allows you to enable the *QuickQ* after you have programmed the voice port extensions and without resetting the computer. After you have enabled *QuickQ*, the *enable QuickQ option* will be the *QuickQ* status feature. This feature indicates *QuickQ*'s current operating status.

The *enable QuickQ status* option can provide information on the hardware status as seen by *QuickQ* upon initialization and after you display the *QuickQ status* window. The messages that will appear are shown on the following list.

All Components acquired	This indicate that the lines and the Voice Ports are functioning.
Line not initialized	This indicates a problem with a line that was programmed as an ACD line. Check the line going into the *QuickQ* DVA. Check programming of lines in ACD.
Link established between PC and DVA	This indicates that there is proper RS-232 serial data communication between the PC and the DVA but there is a problem with one of the other initialization parameters.
Lost link between PC and DVA	This indicates a problem with the RS-232 serial data communication link. Check all serial communication wiring plus, be sure the DVA is powered on.
Voice Ports not initialized	This indicates a problem with a voice port card that you have programmed as a message channel. Check the wiring between the DVA and the DXP station port. Also check the *QuickQ* message channel and extension length programming for the voice port extension.
All voice ports initialized	This indicates all voice port cards programmed in *QuickQ* are functioning properly but there is a problem with one of the other initialization parameters.
QuickQ initialized	This indicates the ACD software is initialized.
OAI Key Code = xxx	This indicates the OAI key code.

The *QuickQ status* window provides information on the communication status of *QuickQ* andthe feature codes. The messages that show are listed below.

Lost communication with announcer	This indicates a problem with the RS-232 serial communication link. Check all serial communication wiring and be sure the DVA is powered on.
Normal communication with announcer	This indicates correct RS-232 serial communication between the PC and the DVA.
OAI Key Code = xxx	This indicates the OAI key code.

Examining The Agent Status Utility

The *agent status* is a real-time agent status window. This window shows the current state of the ACD agents. The first column shows the agent's name. The second column shows the agent's state. The third column shows the call state for the agent's line.

The agent status states that will appear are shown in the following list.

ACCEPT	Supervisor accepts request for help
ACC_CODE	Agent or supervisor entering account code
ANSWER	Agent answered incoming call
BUSY_STATE	Agent in busy state
HELP_REQ	Agent requesting help from the supervisor
IDLE_STATE	Agent in idle state
OUT_ANSWER	Agent on outgoing call
PASSWORD	Agent or supervisor entering password
REJECT	Supervisor reject request for help
SIGN_IN	Agent or supervisor signing in
S_MODE	Supervisor changing mode of operation
S_PLAY	Supervisor playing message
S_RECORD	Supervisor recording message
S_STOP	Supervisor stop playing or recording message
WRAP_UP	Agent has ended call and is in wrap_up state

The call state that will appear are shown below.

C_ANSWER_STATE	Call answered by an ACD agent
C_DISPLAY_STATE	Call displayed on an ACD agents telephone
C_HOLD_STATE	Call on hold by agent
C_IDLE_STATE	No call activity
NO CALL	No call activity
C_MESSAGE_STATE	Call listening to announcement
C_MUSIC_STATE	Call listening to music, on-hold tone, or silence
C_OUT_STATE	Outgoing call by agent
C_RING_STATE	Call processor detects ringing on line

Examining The Line Status Utility

The *line status* scan is a real-time line status window. This window shows the current state of the ACD lines. The first column shows the line name. The second column shows the line state. The third column shows the call state for the line. The fourth column shows the agent with whom the line is associated. The last column shows the voice port on which the line must be programmed. A zero indicates voice port 01.

The line status states that will appear are shown in the following list:

ANSWER_STATE	Line answered by an agent
ANSWER_WAIT	Line answered by an agent
IDLE_STATE	No line activity
MESSAGE_STATE	Message to be played on line
MONITOR_STATE	Line monitored by *QuickQ* waiting for a transfer to the voice port (auto attendent mode)
MUSIC_STATE	Music, on-hold tone, or silence to be connected to line
OFFER_STATE	Call offered to ACD agent.
OUTGOING_STATE	Line used for outgoing call by an ACD agent
OUTGOING_WAIT	Line used for outgoing call by a non-ACD agent
RING_STATE	Line ringing—incoming call
RINGON	Line ringing, but no message to play on line
START_MESS	Message going to play to a line

The call states that appear are shown below.

C_ANSWER_STATE	Call answered by an ACD agent
C_ANS_WAITING	Call waiting for agent or voice port
C_DISPLAY_STATE	Call displayed on an ACD agents telephone
C_HOLD_STATE	Call on hold by agent
C_IDLE_STATE	No call activity
NO CALL	No call activity
C_MESSAGE_STATE	Call listening to announcement.
C_MUSIC_STATE	Call listening to music, On-hold tone, or silence
C_OUT_STATE	Outgoing call by agent
C_RING_STATE	Call processor detects ringing on line

Examining The Voice Port Status Utility

The *voice port status* scan is a real-time voice port status window. This window shows the initialized voice ports and their current state. The voice port states are shown on the following list.

CH_NOT_INIT 0	Voice port not initialize
CH_IDLE 1	Voice port idle
CH_RECORD 2	Voice port used for recording
CH_PLAY 3	Voice Port used for playing a message to a line
CH_SUPER_PLAY 4	Voice port used for playing a message by the supervisor or technician
CH_WAITING 5	Voice port is waiting for a message to be played or recorded

The *clock* window provides useful information. The line under the clock shows the status of the DVA. It also show the hard disk usage. The clock states are as shown below.

Normal	indicates there is no problem with the DVA.
Inactive	indicates that there is a problem with the DVA.
Backup	indicates that the floppy back-up is currently backing up the messages in the DVA.

Problem: Clock shows DVA inactive.

Solution: Check to see if DVA is powered off. If so, turn on the power to it. Also, check all wiring for the RS-232 serial communication link. Finially, reset the DVA by powering the unit off and on.

Section 8
Installing The New Voice Channel Cards

This section describes how to install additional Voice Channel Cards.

Insert the new voice channel card into a slot on the DVA motherboard (Figure 6-1). Connect the voice channel card to the I/O Board with a ribbon cable (Figure 4-1), and secure it to the DVA chassis with two #6-32 1/4-inch machine screws.

NOTE: *Wear a ground strap when working inside the DVA chassis to avoid damaging the DVA circuit boards with a static electricity discharge.*

1. *Remove the three screws that secure the front cover of DVA chassis, and lift the front cover up slightly.*
2. *Locate the next open slot in the DVA motherboard to insert the voice channel card.*
3. *Set the jumpers J2 and J3 to the next voice channel card. Refer to Table 6-1 for jumper settings.*
4. *Switch the power OFF on the DVA.*

NOTE: *Be sure to back up all of the pre-recorded announcements to the floppy disk before powering off the DVA.*

5. Insert the voice channel card into the open slot in the DVA motherboard. Push the voice channel card straight down until it is snugly in place and the metal bracket is flush with the securing bracket.
6. Use the two #6-32 1/4-inch machine screws to secure the voice channel card to the DVA chassis.
7. Connect the ribbon cable to the voice channel connector (Figure 6-4). The red stripe on the ribbon cable indicates Pin 1 on the ribbon connector. The voice channel connector on the voice channel card has pin 1 labeled.

NOTE: *The red stripe on the voice channel ribbon cable must face toward the outside of the DVA chassis.*

8. Connect the other end of the ribbon cable to the voice channel connector on the I/O board (Figure 6-2). The voice channel connectors on the I/O board are labeled 1 through 4, to correspond to the four possible voice channel cards. Select the proper connector for the voice channel card being added. The voice channel connector on the I/O board has Pin 1 labeled.

NOTE: *The red stripe on the voice channel ribbon cable must be facing out of the DVA chassis.*

9. Switch the power ON on the DVA.
10. Test the voice channel card. Refer to the Section 7 paragraph titled, *Testing voice channel card*.
11. Close cover.

Appendix 1
Using QuickQ With A Mouse

A mouse is a device that allows you to move a cursor on the screen to specific points for data entry, and other menu selections (Figure A1-1). An arrow image, called the mouse pointer, moves on the screen when you move the mouse. Practice moving the pointer. Stay away from the menu bar at the top of the screen. (If you accidentally make a menu appear, you can make it disappear by moving the pointer out of the menu and pressing and releasing the left mouse button.)

Occasionally the pointer might seem to disappear. Usually it is just off the screen. To make the pointer reappear, move the mouse in a circle a few times.

To move the mouse without moving the pointer, lift up the mouse. The pointer doesn't move while the mouse is in the air.

Most of the time, you use one of the following two mouse button techniques:

- clicking,
- dragging.

Clicking (Selecting an item): To click, press the left button and immediately release it. By clicking, you can select an item, such as a menu or an icon.

Note that the top left corner of the screen has a sign-in label. Use it to perform the following exercise. Place the pointer at the sign-in title and click the mouse button. The *QuickQ* opens a window.

Dragging (Moving a window): Dragging consists of three steps:
1. pressing and holding the left mouse button,
2. moving the mouse,
3. releasing the mouse button.

Dragging allows you to move the position of a window on the screen. You can position different windows on the screen to give yourself a better view of system set-up parameters, (for example, the announcement window and the line group window). Having both windows appear at the same time, you can identify the announcement messages assignment that is relative to the line groups. To move the sign in window, place the pointer on the title bar (system access), and drag. As you drag, an outline of the window moves with the pointer's. Practice moving the sign in window on the screen.



Figure A1-1. Using The Mouse

Window Graphic in QuickQ

If you are familiar with a window environment, you can skip this discussion.

QuickQ is easy to use. Most of what you see and do in the ACD console happens in a window. A window is a screen area that the *QuickQ* system uses to exchange information with you. There are many windows. For example, you enter your password through a window,. *QuickQ* displays the Line-group data through a window, and so forth. You can move, resize, zoom, overlap, close and open one or more windows in one screen. While you can have any number of windows opened, only one window can be active at any time. The active window is the one that you are currently working in. Any command that you choose or text you type generally applies only to the active window.

The active window always has a close box, and may have a zoom box, scroll bars, and a resize corner. (Figure A1-2 shows a typical window). If your windows are overlapping, the active window is always the one on top of all the others (the foremost one).

As stated above, all *QuickQ* windows have the following features in common:

- **a title bar,**
- **a close box,**

The Title Bar: The topmost horizontal bar of a window contains the name of the window. You can drag the title bar to move the window around.

The Close Box: This is the box in the upper left corner. You click your computer's mouse on this box to quickly close the window.

The Zoom Box: This box may appear in the upper right corner. If the icon in that corner is an up arrow, you can click on the arrow to enlarge the window. If the icon is a doubleheaded arrow , you can click on this to return the window to its previous size.

Some of the more complex windows have the following additional features:

- **scroll bars,**
- **resize edges,**

Scroll Bar: The scroll bar, if available, appears in the right side of the window. You use your mouse with this bar to scroll the contents of the window. Click on the arrow at either end to scroll one line at a time. (Keep the mouse button pressed to scroll continuously.) You can drag the the scroll box at any spot on its bar to move it to a more convient position.

Resize Edges: The four extreme edges of a window are the resize edges. You can drag any edge to make the window larger or smaller.

Help Box: A help window, if available, will give you further instructions specific to the active window. Press F1 to open the help window.

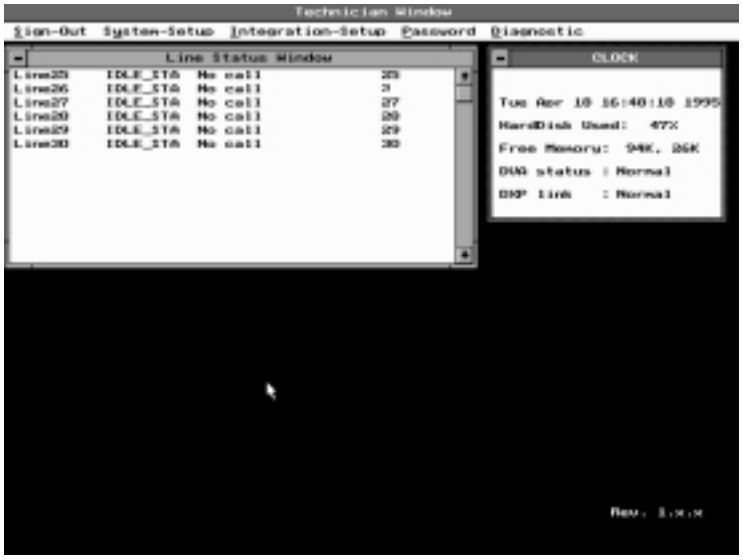


Figure A1-2. Viewing A Typical QuickQ Window

Appendix 2: Reviewing The Programming Road Map

Start-up Screens

Sign-In
ID # XXX
Password XXX

Technician's Screens

System Setup
QuickQ Master Setup
Master Extension
Master 2 Extension
QuickQ OAI Key Code
QuickQ Line Setup
Name
Group
Subgroup
Line No.
Voice Port Config.
Voice Port No.
Station
Type
Printer Setup
Printer Type
Other
Epson LQ
HP Laser
HP DJ 500
HP DJ 550C
Printer Port
LPT 1

Integration Setup
External Overflow

Password
Old Password XXX
New Password XXX

Diagnostic
QuickQ Status
Agent Status Scan
Line Status Scan
Voice Port Status Scan

System Manager's Screens

System Setup
Company Name
ID Password
Group Name XXXXXXXX
Supervisor Name XXXXXXXX
ID # XXX
Password XXX
Time/Date
Date dd-mm-yyyy
Time HH:MM
Group Programming
Group 01-16
(link to group supervisor screens)
Intergroup Overflow
Group 01-16
Level 01
Level 02
Level 03
Level 04
Announcement
Message
Message 1-16
Description
Current Time MM:SS
Limit Time MM:SS
Backup
Account Code
Starting Number Range X
Account Code XXX
Description
System Backup
Stat Bin
Answer Bin
Time Bin 1 MM:SS
Time Bin 2 MM:SS
Time Bin 3 MM:SS
Time Bin 4 MM:SS
Time Bin 5 MM:SS
Time Bin 6 MM:SS
Abandon Bin
Time Bin 1 MM:SS

Management Info.
Real Time
System Agent Status
System Line Status

Historical

Current
Hourly
Report Type
Answer Bins
Abondon Bins
Incoming Calls
Total Time
Average Time
SystemCcapacity
Traffic Analysis
Account Code
Report Format
Numerical
Graphical
Note
Print
Daily
Report Type
Answer Bins
Abondon Bins
Incoming Calls
Total Time
Average Time
SystemCcapacity
Traffic Analysis
Account Code
Report Format
Numerical
Graphical
Note
Print
Configuration
Group
System
Technician
Print

Group Supervisor's Screens

Group Setup
Overflow Threshold MM:SS
Redirect Threshold MM:SS
Alarm Threshold MM:SS
Alarm Threshold Calls in Queue
Priority Override MM:SS
Call Screening Yes No
Automatic Force Call Yes No
Manual Answer Yes No
Day To Night Mode Yes No
Time For Day To Night Mode HH:MM

Agent Group–Setup
AgGp_01
AgGp_02
AgGp_03
AgGp_04
Agent Group Name XXXXXXXX
Agent Name XXXXXXXX
ID # XXX
Password XXX
Priority 01-04
Wrap-Up MM:SS

Line Group Setup
LnGp_01
LnGp_02
LnGp_03
LnGp_04
Line Group Name XXXXXXXX
First Message X
Second Message X
Night Message X
Special Message X
First Message Delay MM:SS
Music Interval MM:SS
Line Group Priority 01-04

Management Info
Real Time Setup
Incoming Call Parameter MM:SS
Outgoing Call Parameter MM:SS
Busy Call Parameter MM:SS
Real Time
Traffic Activity
Agent Activity
Traffic Status
Service Status
Agent Status
Historical
Current
Hourly
Report Type
Waiting Time
Abandon Call
Incoming Call
Agent Activity
Average Time
System Capacity
Report Format
Numerical
Graphical
Note
Print
Daily
Report Type
Waiting Time
Abandon Call
Incoming Call
Agent Activity
Average Time
System Capacity
Call Profile
Account Code
Report Format
Numerical
Graphical
Note
Print
Configuration
Group
Print

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Introducing The QuickQ System

Using This Guide

This manual will assist you in using your *QuickQ* automatic call distributor. It provides a complete description of the *QuickQ* features, a detailed outline of the system configuration, and general operating instructions.

Certain typographical conventions appear throughout this guide to simplify the instructions. These are explained below:

- Text that appears on the screen is shown as, for example, `Enter your password`.
- Text that you have to type is shown in two different ways:
  - 'type **Albert Smith** at the appropriate box' means that you should type the characters exactly as shown, but
  - 'type your password' means that you should type the actual digits of your password.
- Keys that you are required to press are shown as, for example, **Enter**.

***Note**: On some keypads, the Enter key may be called Return.*

The word *select* is used to describe the use of either the mouse or the direction arrow keys to highlight an option on the screen.

Notes bring your attention to a particular item. ***Notes*** are given between paragraphs of text, and are shown in the following form:

***Note**: If you are using the keyboard use the Tab key to move from field to field. If you are using the mouse, click on the field you wish to work with.*

Understanding QuickQ

QuickQ is an Automatic Call Distribution (ACD) system designed to handle incoming calls as efficiently and economically as possible. It answers calls by distributing the workload equally among the Agent staff. Typically, *QuickQ* speed, efficiency and management control usually results in a 20–40 percent increase in the productivity of the Agent force and a 10 to 20 second decrease in the average call answer time. The four primary functions of the *QuickQ* are as follows:

- provide a waiting queue to increase the effective arrival rate of the incoming calls, and to allow more productive time for the Agent,
- play prerecorded announcements when no Agents are available thus encouraging the caller to wait in a queue,
- automatically distribute the workload among the Agents to allow an equal distribution of duties, effecting greater productivity,
- provide comprehensive statistical management reports that allow rational and efficient allocation of the call center's resources.

Any corporation or company that answers incoming telephone calls with a staff of Agents or trained people is a potential candidate for the considerable cost savings and service benefits of the *QuickQ*.

In an automatic call distribution (ACD) application, a calling customer needs to reach a service person in a particular area but does not need to reach a specific individual. For example, the customer may be calling a company to place an order, check a reservation, or talk to a support or help desk. In all cases, it is important that the call be answered as quickly as possible by any service person in that area.

It is statistically proven that a single large group of agents is more productive than an equal number of agents in several smaller groups provided that the calls are homogeneous.

Calling traffic is considered homogeneous when anyone within a group of trained representatives can effectively handle the call; however, this uniformity does not imply that ACD systems can handle only one type of call. Many successful operations exist where different types of calls reach specially trained operators in a busy call center. However, it is more efficient to separate different types of calls into groups. *QuickQ* has the ability to configure the ACD operation into 16 groups, each of which can have four sub-groups.

Organizing The Call Center Staff

An ACD center requires specialized personnel. If the department is large enough, an effective ACD staff will consist of the following personnel:

- System Manager,
- Group Supervisors,
- Telephone Agents.

The System Manager is directly responsible for the day-to-day operation and maintenance of the ACD center. In smaller systems, the System Manager's task may be combined with the Group Supervisor's responsibilities. The System Manager can monitor the overall performance of the ACD center and has several responsibilities including the following items:

- control of systems configuration, such as the number of groups and overflow between groups,
- effectively balance the staffing of the ACD center according to the traffic demands of the various groups.

The Group Supervisor is directly responsible for the following responsibilities:

- Move, add and delete Agents required for the ACD center.
- the telephone service provided by Agents in their respective groups,
- monitoring the activity of the Agents,
- evaluating the performance of the Agents,
- providing assistance on calls beyond the capability or training of the Agents.

The Telephone Agent is often referred to as a Customer Service Representative (CSR) and is mainly responsible for a particular group of telephone lines or a certain type of call; however, the system allows assignment of multiple group agents that are a part of more than one group.

Describing The System Components

NOTE:You can ensure continuous QuickQ operation by adding an uninterruptable power source to both the digital voice announcer and central call processor, and an optional battery backup assembly to the DXP digital communications system.

Call Processor

The call processor is the brain of the *QuickQ*. It consists of the *QuickQ* software and a personal computer. The call processor monitors and controls all activities within the boundaries of the ACD.

Digital Voice Announcer

The Digital Voice Announcer (DVA) is a stand-alone voice processing system designed to directly interface with the DXP digital communications system. It provides storage for up to 16 digitized voice announcements for playback under control of the central call processing unit. In a busy call center when all Agents are busy, the DVA intercepts incoming calls and plays prerecorded voice announcements.

Telephone Extensions

The Agent's and Supervisor's stations are typical DXP proprietary telephones (12 or 24 Button Display Sets).

Describing QuickQ System Features

Answer Bin

An Answer bin is the length of time between when a call arrives in the queue and when it is answered by an Agent. There are six answer bins in the system. The system answer bin default time is zero. By setting the time frames in the answer bins, the Manager can look at one factor in the total customer service picture. An example of a typical answer bin record is shown below.

Answer Bin	Number of Calls	Time	Definition
Bin 01	0	00:20	The number of calls answered between 0 and 20 seconds, (0)
Bin 02	5	00:40	The number of calls answered between 20 and 40 seconds, (5)
Bin 03	2	01:00	The number of calls answered between 40 seconds and 1 minute, (2)

Abandoned Bin

Abandoned bin is the time between when a call arrives in the queue and when the caller hangs up without being connected to an Agent. There are six abandoned bins in the system. The system abandoned bin time defaults are zero. By setting time frames in the abandoned bins, the Manager can determine how tolerant customers are of the waiting time to which they are being subjected. An example of a typical abandoned bin is shown below.

Abandoned Bin	Number of Calls	Time	Definition
Bin 01	0	00:10	The number of calls abandoned between 0 and 10 seconds, (0)
Bin 02	11	00:30	The number of calls abandoned between 10 and 30 seconds, (11)
Bin 03	15	00:50	The number of calls abandoned between 30 and 50 seconds, (15)

Call Queuing

The *QuickQ* manages incoming calls in a logical sequence. The number of incoming calls arriving at a call center at any one time is random. The calls are queued on a first in first out principle. Call queuing ensures that calls are handled in a timely and efficient manner. Priority can be assigned to preferred lines such as Inwats (800 lines).

Even Distribution

The *QuickQ* effectively shares the incoming call workload evenly among agents. This ensure the optimum productivity of all agents by distributing calls to the longest idle agent.

Delay Announcements

Delay announcements are important money-saving features that help keep the queue working in an efficient manner. Since telephone traffic is random, there will be occasional bursts of calls to any ACD. Such sporadic increases in volume may force callers to wait for connection longer than they would like. By recording delay announcements (such as, Hello you have reached XYZ Company. All of our operators are busy at the moment, but please hold and our next available operator will be with you momentarily.) you assure the callers they are important and that their call will be answered in sequence, and that they should wait and not hang up. Without this announcement most people will hang up after five or six rings.

Note: Be creative with your messages, provide important information, advertise special promotions, and in general, keep your customers entertained and informed while they are waiting.

Management Information System (MIS) Reporting

The *QuickQ* system provides both real time and historical statistical information on the performance of the call center (Agent or line activity).

- Real-time screens are shown for System Managers and for Groups in Section 5 under the heading Selecting The Real Time Report.
- Historical information is described in details in Section 5 under the heading Selecting Historical Reports.

Describing QuickQ Agent Features

Account Codes

The system can provide a table of account codes arranged so that a unique number corresponds to a specific call type (for example, call content, product type, and so forth). For example, a software help desk may wish to use account codes to categorize its calls as follows:

Code	Call Category
100	Help with Set Up
200	Help with MS DOS
201	Help with Networked DOS
300	Help with Word Processing
301	Help with Databases
302	Help with Spreadsheets

Agents can enter the account code that corresponds to the type of call they have just dealt with. This information is stored in the systems statistics. System Managers can use the Management Information Report System to analyze the types of traffic and the topics of that traffic use the Management Information Report System.

Calls Waiting Indication

The calls waiting indication details the number of calls waiting in the queue. The system displays this information on both the Agents and Supervisors telephones. The calls waiting indication prompts Agents to quickly complete their present activity and answer the calls waiting in the queue. It alerts Supervisors to release available Agents who had been assigned to other tasks.

Log-in / Log-out

Agents move in or out of the system on an individual basis. Each Agent has his or her own three-digit user ID and password. Agents log into the system at the start of their day and log out of the system at the end of their day. When they take lunch or coffee breaks, they use the make set busy feature.

Make Set Busy

An Agent can manually make their telephone busy by pressing the **BUSY** interactive button. This allows the Agent to temporarily leave the system (during lunch or breaks).

Supervisor Help and Monitoring

The Supervisor uses the help and monitoring capabilities to provide expert advice to Agents on difficult calls. Supervisors can listen to Agent/customer conversations to ensure courteous and efficient service. The Help function allows the Agents to request the Supervisor's help without interrupting the call in progress.

Wrap-up Time

Immediately after he or she terminates a call, the system places that Agent's telephone into the wrap-up mode. During this wrap-up time, the agent will not be presented any calls. Usually the Agent will take this time to finish any paperwork associated with the call just completed. The Group Supervisor programs the wrap-up time for each individual Agent. Experienced Agents may require less time to wrap up a call than less experienced Agents.

An Agent can shorten a call's wrap-up time by pressing the **READY** interactive button, and similarly can extend a call's wrap-up time by pressing the **BUSY** interactive button.

Describing QuickQ Group Features

Each Group Supervisor can program these features independently for each group to meet its specific requirements.

Alarm Threshold (Time)

Alarm Threshold (Time) is a preprogrammed time parameter to monitor the number of calls waiting in queue (default period is 45 seconds).

Alarm Threshold (Calls in Queue)

Provides an indication to Agents & Supervisors that the number of calls waiting in queue has gone beyond the Alarm Threshold (Time). If the Alarm Threshold (Calls in Queue) is set to a number higher than zero (0), an audible tone will go off at all Agent's telephones when that preset number of calls has reached the Alarm Threshold (Time). If the Alarm Threshold (Calls in Queue) is set equal to zero (0), the alarm will not go off even if calls have reached the Alarm Threshold (Time). Statistics will still be collected for MIS Reports.

Automatic Day-to-Night Mode

Each Group Supervisor can set their group to automatically switch from day mode to night mode.

- In night mode, the system answers the incoming calls, plays the prerecorded night announcement, and releases the call.
- The system will automatically log all agents out when all calls holding, prior to night mode are answered.

Automatic Night-to-Day Mode

QuickQ switches from night mode to day mode when the first Agent of the group logs into the system to take calls. This ensures there is always someone logged in to take calls before the system accepts them.

Automatic Answer Mode

An Agent that operates in the automatic answer mode wears a head set. For incoming calls, the system rings the agent's telephone and connects the call directly to it.

Manual Answer Mode

An Agent in manual answer mode chooses to answer the incoming call or to reject it using the interactive buttons on his or her telephone.

Overflow Group

The overflow group is a secondary group of Agents to whom the system will direct calls after the overflow threshold time-out occurs (default is 210 seconds). The overflow group allows agents in more than one group to handle calls. By handling calls from other groups, Agents increase the overall call handling efficiency of the system. The system allows 4 overflow groups for each group. The overflow groups are set by the System Manager.

Note: Overflow level 4 can be set to a specific Non-ACD extension.

Example:

Agents in Group Two will receive calls from Group One when the preprogrammed period of time (default is 210 seconds) has gone beyond the overflow threshold (preset depending on the Group's requirements).

Overflow Threshold

The overflow threshold is the period of time that the system holds a call before it transfers it to an overflow group.

Priority Call Handling

There are four call handling priority levels (01 is the highest priority and 04 is the lowest priority). System Managers can assign a priority status to sub-groups of telephone lines. The system will queue the calls that arrive on those lines ahead of the calls that arrive on non-priority lines.

Example: Assign 800 numbers a priority of 01 so Agents will answer these calls before they answer any other call. This is important, as billing starts as soon as the *QuickQ* answers the call.

Individual Agents can have a priority status (01 to 04). The system assigns calls to Agents with the highest priority before it assigns calls to lower priority Agents.

Example: Assign Agent 200 a priority of 01 and Agent 209 a priority of 04. Agent 200 will receive incoming calls before Agent 209 receives any regardless of idle time. This allows Agent 209 to be available for calls yet be less likely to be interrupted from any other assigned work. This means Agent 209 can do assigned paperwork during a known slack period and still be available to answer calls if all other Agents are busy.

Redirect Threshold

If a call is not answered by an Agent (for example, the Agent forgot either to log-out or to make their telephone busy before leaving their desk) for a period of time defined as the redirect threshold time, the system will redirect the call to another Agent or group and automatically make the Agent's telephone busy. This occurs only in Manual Answer Mode.

Call Screen Mode

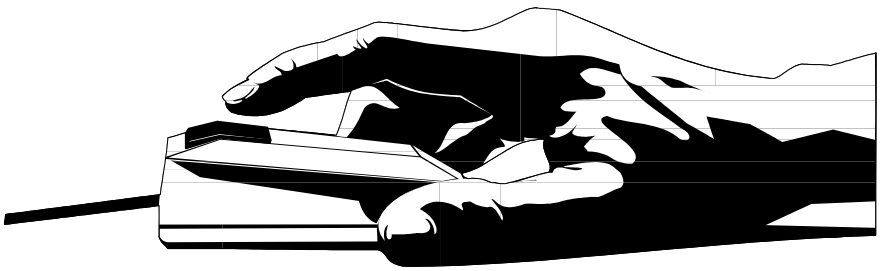
This mode of call routing sends all calls to the digital voice announcer. Callers hear the complete initial delay announcement before their call is directed to an Agent. Usually the message is used to provide the caller with certain information (promotional information or instructions such as "Please have your credit card number ready") prior to talking to an Agent.

Using the Mouse and Keyboard

You can use the *QuickQ* system with either the mouse pointing device or the standard keyboard. Employ the method with which you feel most comfortable

If you are unsure how to navigate the *QuickQ* menus and enter data or select items, refer to Appendix A for a description of the *QuickQ* graphical windowing environment, and details for using the mouse and keyboard.

If you are confident that you can use these techniques adequately, go on to *QuickQ* programming.



Programming QuickQ

You can program the *QuickQ* features by any of the following parameters:

- System,
- Group,
- Sub-group,
- Agent.

You must program *QuickQ* from the system console windows graphic environment using either the mouse or the keyboard. If you are not familiar with using a mouse or the keyboard in a windows graphic environment, refer to Appendix A.

Understanding System Startup

At initial installation, the installer performs system startup and programs the DXP digital communications system and the *QuickQ* to work together.

The system begins operation with the following default settings:

- Technician ID # 832
- System Manager ID # 900
- Group Supervisor ID # 901 to 916
- Agent's ID # No default
- Overflow Threshold 210 seconds
- Alarm Threshold 45 seconds
- Priority Override 2 minutes
- Automatic Force Call No
- Day to Night Mode Yes
- Agent Priority Level 01
- First Message 1
- Night Message 3
- First Message Delay 10 seconds
- Line Priority Level 01
- Technician Password 832
- System Manager Password 900
- Group Supervisor Password 901 to 916
- Agent Password No default
- Overflow Group No overflow
- Redirect Threshold 20 seconds
- Alarm Threshold Calls in Queue 0
- Call Screening No
- Manual Answer Yes
- Time for Day to Night Mode 5:30 p.m.
- Agent Wrap-up 10 seconds
- Second Message 2
- Special Message 4
- Music Interval 30 seconds

To determine which settings are applicable to you, refer to the relevant headings on the following pages.

Preparing System Layout / Worksheets

Prepare the system manager's programming worksheet before you actually configuring the system at the console, and use this worksheet as a reference to assist you in entering the information required over the following pages. There is an example worksheet in Appendix B.

Programming The System Level Configuration

Performing Initial Sign In

Use the following steps to gain access to the system.

1. Press **Esc** to close the QuickQ Status window (Figure 3-1).

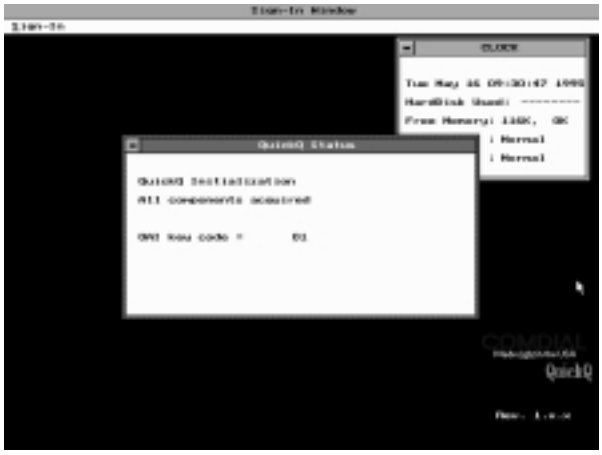


Figure 3-1 QuickQ Status Window

2. On the main system window, select the `Sign-In` menu bar option. Either move the pointer to it and click the left mouse button, or hold down the **Alt** key and press the **S** key (Figure 3-2).

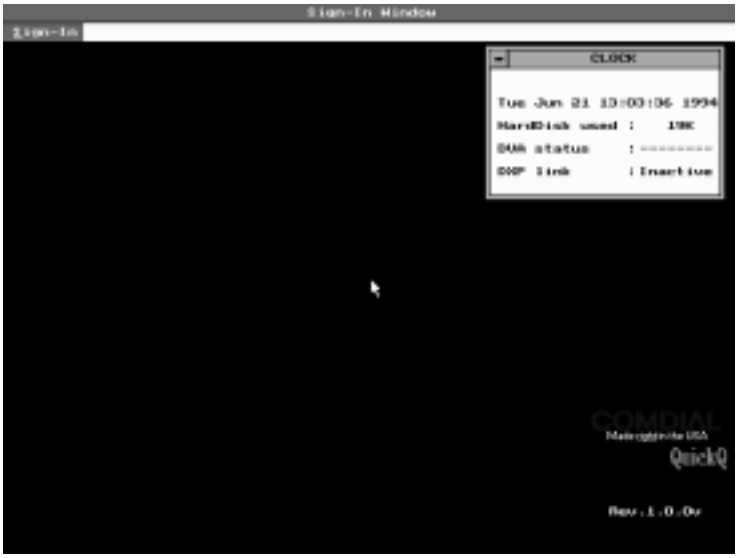


Figure 3-2 Sign In Window

3. The System Access window appears, and the `ID#` box will display 100. You can type without having to first clear this value (Figure 3-3).

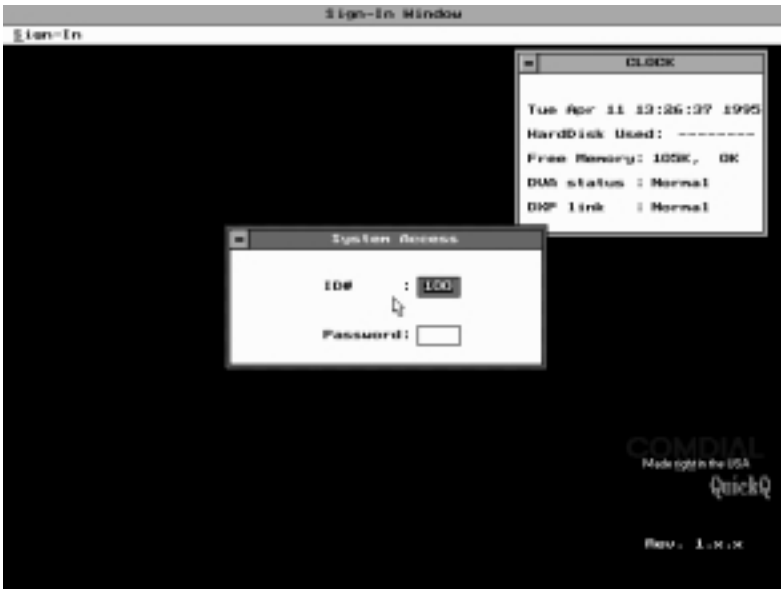


Figure 3-3 ID and Password

4. The System Manager ID# and the password both default to 900. Type **900** at the ID# box and press **Enter**. The highlight moves to the Password box. Type **900** again and press **Enter**.

5. The Supervisor/Manager Sign In window appears. Highlight the `Manager` line and press **Enter** (Figure 3-4).



Figure 3-4. Supervisor Sign In Window

6. The screen display changes to show the Manager window, and the menu bar will now display a series of five options:
   - `Sign-out`
   - `System-Setup`
   - `Group-Programming`
   - `System-Backup`
   - `Management-Info`

You are now signed in to the *QuickQ* system. For security reasons you may wish to change your ID# and password at this time.

Setting Up The System

Setting the Company Name

1. Select `System Setup` from the menu bar. This will display a menu containing seven options:
   - `Company Name`
   - `ID/Password`
   - `Time/Date`
   - `Intergroup Overflow`
   - `Announcement`
   - `Account Code`
   - `Stat-Bin`

2. Select the `Company Name` option. The Company Name window appears. Type in the desired company name.

3. To save the changes, click on `Save-To-Disk`, or hold down the **Alt** key and the **s** key at the same time.

4. The Save Company Name window appears. Selecting `Yes` or press **Alt Y** prompts the system to save the changes and to close all windows automatically. Selecting `No` or press **Alt N** returns to the Company Name window. You can now close this window by pressing **Esc** or double clicking on the close box.

Changing Passwords and ID's

Using the following procedure, select the group of your choice from the ID/Password window, change the group names, change the Supervisor names, and change the ID# and passwords of the Supervisors of all groups.

1. Pull down the `System Setup` from the menu bar and select ID/Password from the second line of the menu.

2. The menu closes and the ID/Password window appears with the highlight bar over the `Gp. 00 SYSTEM` line. Press **Enter** or click on the highlight with the mouse (Figure 3-5).

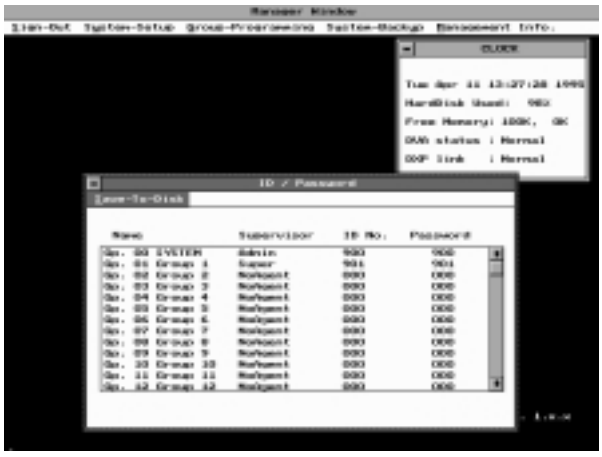


Figure 3-5. IDs/Passwords

3. The Edit ID and Password window appears as shown in Figure 3-6.

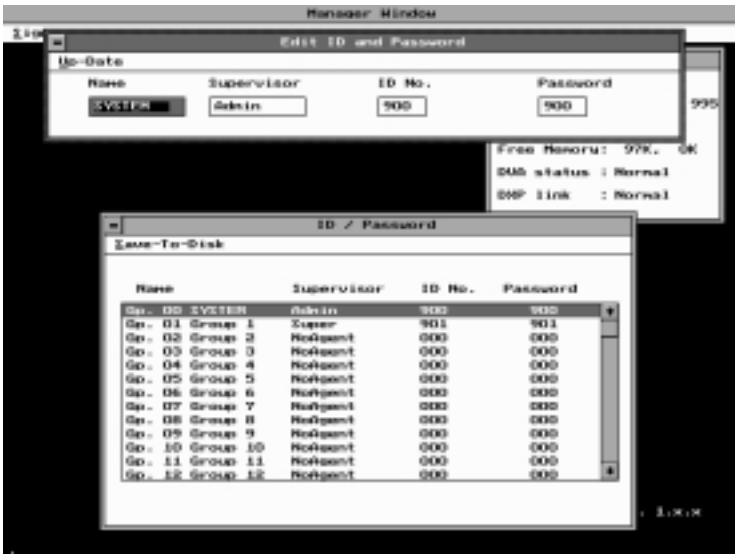


Figure 3.6. Edit ID and Password Window

Note: Group 00 refers to the Manager's Password/ID. This does not refer to one of the call processing groups. For Groups 01 - 16, enter the name of each department that will be processing ACD calls.

4. If you wish to change the name, type in the new name at the highlight. To move to the Supervisor box, press the **Tab** key or click on the box with the mouse.

5. If you wish to change the name of the Supervisor, type in the new name. To move to the ID# box, press the **Tab** key or click on the box with the mouse.

6. Type in the ID# you wish to use (you can use only numeric digits for the ID# and password, Range 100 to 999).

7. Move to the `Password` box and type in the password you wish to use (you can use only numeric digits for the ID# and password 100 to 999).

8. When you have entered the details in the boxes to your satisfaction, select the `Up-date` option from the menu bar or press **Alt U** to save your new details.

9. The Save Changes window appears. If select `Yes` or press **Alt Y**, the system saves the changes and closes the Save changes window and the Edit ID and Password windows automatically. Select `No` or press **Alt N** returns to the Edit ID and Password window. Press **Esc** or double click on the closebox to exit the Edit ID and Password window. You can now set or change other system parameters.

10. After making all necessary changes, select the `Save-To-Disk` option on the menu bar or press **Alt S** to save the changes to the hard drive.

11. The Save ID / Password window appears. If select `Yes` or press **Alt Y**, the system saves all changes made and all windows closes automatically. If your option is `No` or if you press **Alt N**, the Save ID / Password window closes. You will return to the ID / Password window. You can now exit this window by pressing **Esc** or double click on the close box.

Setting the Time and Date

The time and date are set within your telephone system (refer to your Telephone User Manual). This option is used to synchronize the QuickQ time and date to the Phone system. This function is performed automatically every hour, but can be performed manually as follows:

1. Pull down the `System Setup` menu.

2. Select `Time/Date`. A small Time/Date window appears.

3. If the displayed time and date are incorrect, click on the `Syn. Clock` box, or press **Enter**. This synchronizes the clock with the clock in the DXP (Figure 3-7) and closes the window automatically.

4. If no changes are necessary, close the window by double clicking on the close box or pressing the **Esc** key.

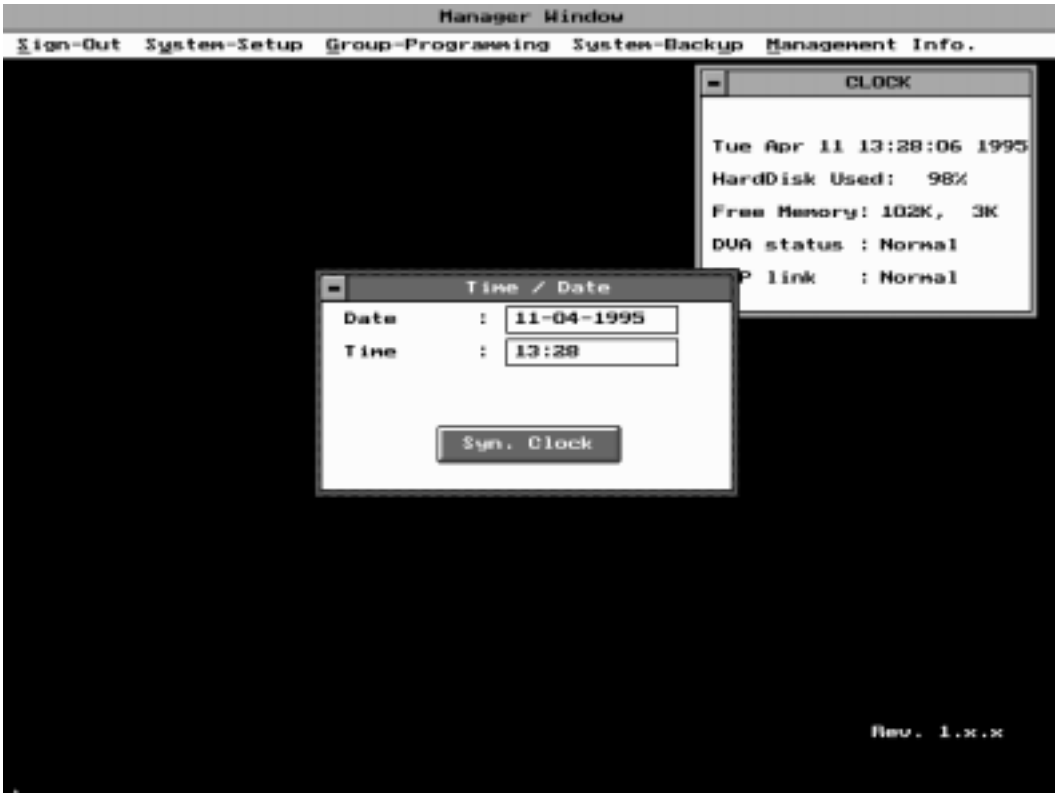


Figure 3-7. Synchronizing The Clock

Setting the Intergroup Overflow

Intergroup overflow improves the effectiveness of a Call Center by utilizing additional groups (departments) as back-up to answer calls, if the primary group is busy beyond the set time parameters. Once the overflow timer has been exceeded, the system presents the call to the first available of the five groups (primary and four overflow). For calls to overflow to the appropriate groups, you must set the overflow patterns using the following procedure:

1. Pull down the `System-Setup` menu and select the `Intergroup Overflow` option. The InterGroup Overflow window appears with a list of each group and their respective overflow levels (Figure 3-8). Overflow level 4 should display four extension numbers.

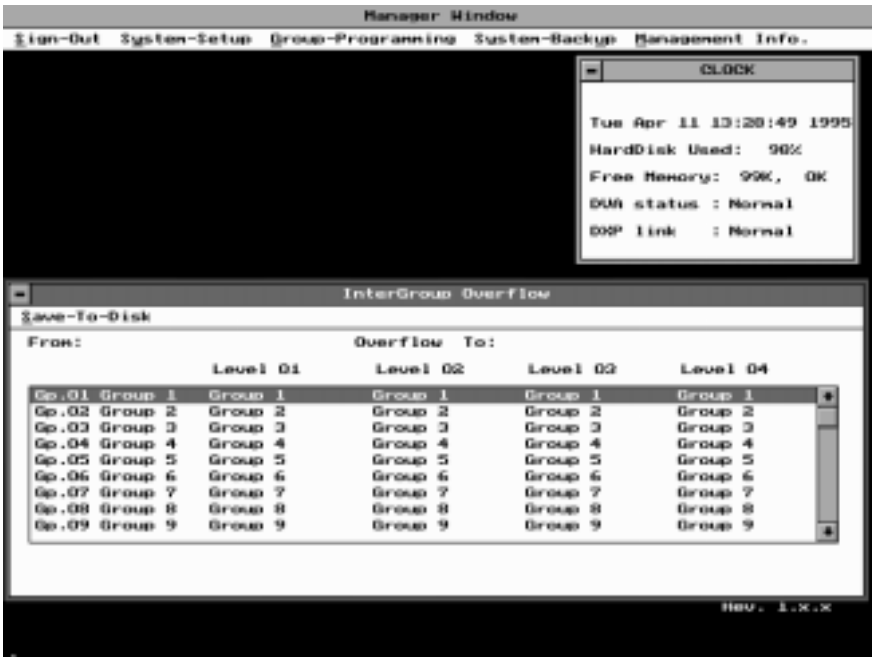

Manager Window
Sign-Out System-Setup Group-Programming System-Backup Management Info.
CLOCK
Tue Apr 11 13:28:49 1995
HardDisk Used: 90%
Free Memory: 99K, OK
DNA status : Normal
DXP link : Normal
InterGroup Overflow
Save-To-Disk
From:
Overflow To:
Level 01
Level 02
Level 03
Level 04
Gp.01 Group 1 Group 1 Group 1 Group 1 Group 1
Gp.02 Group 2 Group 2 Group 2 Group 2 Group 2
Gp.03 Group 3 Group 3 Group 3 Group 3 Group 3
Gp.04 Group 4 Group 4 Group 4 Group 4 Group 4
Gp.05 Group 5 Group 5 Group 5 Group 5 Group 5
Gp.06 Group 6 Group 6 Group 6 Group 6 Group 6
Gp.07 Group 7 Group 7 Group 7 Group 7 Group 7
Gp.08 Group 8 Group 8 Group 8 Group 8 Group 8
Gp.09 Group 9 Group 9 Group 9 Group 9 Group 9
Rev. 1.x.x

Figure 3-8. InterGroup Overflow Window

2. Use the Up and Down arrows and the **Page Up** and **Page Down** keys to highlight the group for which you wish to set the overflow parameters, and either press **Enter** or click on it with the mouse to select it.

3. The Edit *ACD* InterGroup Overflow window appears.

4. Press the Up/Down arrow keys to change between groups. Alternately, you can press the **Enter** key on a highlighted field to cause a pull-down menu to appear, then highlight the overflow option for that field. Press **Enter** again to insert the highlighted setting in the field and close the menus. To set the four overflow levels, use **Tab** to move from field to field. With the mouse, click on the down arrow at the end of the field to display the same menu. Click on a menu option to select it. This action automatically closes the menu.

5. When you have set the four overflow levels to your satisfaction, use the mouse to click on the `Up-Date` menu bar option and close the box or Press **Alt U.**

6. The Save Intergroup Overflow window with `Yes` and `No` option appears. Use the mouse to click on `Yes` or press **Alt Y** to save changes and automatically closes the menu. Click on `No` or press the **Alt N** key to return to the Edit ACD Intergroup Overflow window. If, at this point, you wish to exit the window, double click on the close box with your mouse or press the **Esc** key**.**

7. When you have set the overflow patterns for all of the groups that you will use, use the mouse to click on the `Save-To-Disk` option on the menu bar or press **Alt S**. The Save Intergroup Overflow window appears. Select `Yes` or press **Alt Y** saves the changes and closes the windows automatically. Press the **Esc** key or double click on the close box to exit.

Setting Announcement Titles

The integrated D.V.A. provides voice storage for 16 messages (total 5 min. 20 sec. recording time). These messages are recorded from any telephone set logged in as a supervisor.

Note: Describing the content of these messages can be added to the P.C. by the manager.

Use the following procedures to set the Announcement Titles:

1. Pull down the `System Setup` menu and select the `Announcement` option.

2. The Message window appears (Figure 3-9) to provide information.3.Use the **Tab** key or click on the mouse to move the highlight to the D e s c r i p t i o n field ofthe message that you wish to title. Type a reminder note to help you identify and locate the various messages.

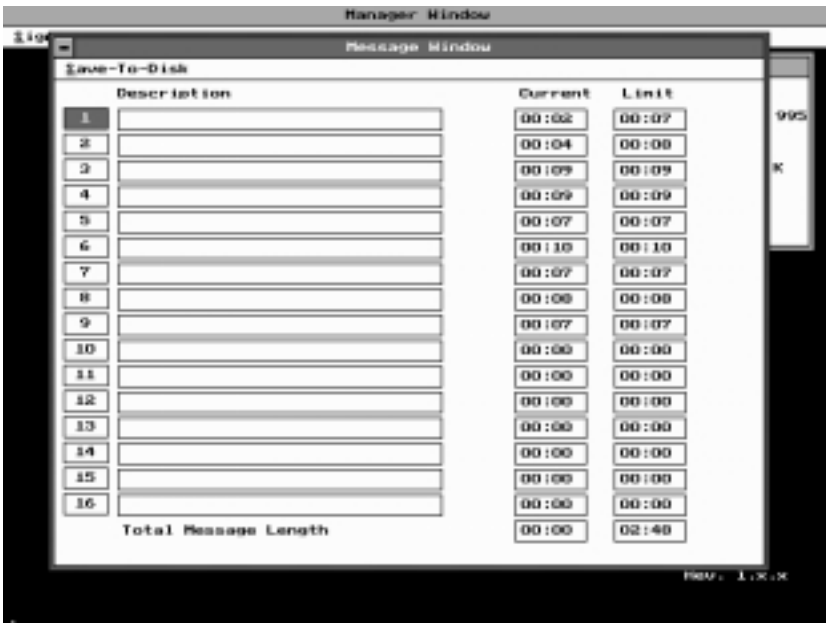


Figure 3-9 Message Window

3. Use the **Tab** key or click on the mouse to move the highlight to the D e s c r i p t i o n field of the message that you wish to title. Type a reminder note to help you identify and locate the various messages.

   Note: The times shown beside the descriptions detail both the total time allocated to the message (that is, the length of time occupied by the,first version of the message) and the amount of recording time that the current message occupies.

4. If a number is selected by clicking on the mouse or pressing Enter, it will open the Message Information window indicating which group and subgroup is assigned the message. It also indicates whether the message is a first, second, night or special message. This window is mainly for information purpose and does not include editing function. Press Esc or double click on the close box to exit.

5. After updating the reminder notes for different messages, select Save-To-Disk. The Save Changes window will appear. Select **Yes,** or press **Alt Y** to save the changes and close both windows. Select **No** or press **Alt N** to return to the Message window. Press **Esc** or double click on the close box to exit.

Assigning Account Codes

QuickQ enables you to classify calls into various categories by assigning account codes to the calls. Agents classify each call from their telephone using the account codes that the System Manager assigns with this procedure.

1. Pull down the `System-Setup` menu and select the `Account Code` option. The Account Code Range window appears.

2. Type the appropriate account code range and click on the `Ok` button. The Account Code Setup window appears (Figure 3-10).

   Note: The Account Code Range window allows you to select a range of account codes from a long list. If you only have a few account codes, you can bypass this screen by clicking on the Ok button.

3. To add new account codes, select `Add` from the menu bar or press **Alt A.** The Add Account Code Setup window appears.

4. Enter the new three digit code and press Enter. Type a description of the account code in the `Description` area. Click on the Create Account menu bar or press **Alt C.** The Add Account confirmation window appears.

   Note: The code and description appears in the Account Code Report.

5. Click on **YES** or press **Alt Y** to add the information that you have just entered onto the Account Code Setup list. The system returns to the Add Account Code Setup window for another entry. If no further account is to be entered, press Esc or double click on the close box to close this window. You will return to the Account Code Setup window.

6. To edit an existing code, highlight the code and press **Enter** or click on the code with the mouse. The Edit Account Code Set up window appears.

7. After making the necessary changes, select `Update` from the menu bar or Press **Alt U. The Save** Changes to Account window appears. Click on `Yes` or press **Alt Y** saves all changes made to the code. The Edit Account Code Setup window & Save Changes to Account window disappears automatically. You will return to the Account Code Setup window.

8. To delete an Account Code, highlight the code and press **Enter** or click on the code with mouse. Select `Delete` from the menu bar or Press **Alt D** on the Edit Account Code Setup window. The Delete Account confirmation window appears. Click on `Yes` or press **Alt Y** will delete the account code highlighted. The Edit Account Code Setup window and Delete Account confirmation window closes automatically. Click on `No` or press **Alt N** closes the Delete Account confirmation window. You are now returned to the Edit Account Code Setup window. If no further changes is desired, Press Esc or click on the close box to exit.

9. After you finish setting up your account codes, select `Save-To-Disk` on the menu bar or Press **Alt S.** The Save Account Code(s) confirmation window will appear. Click on **Yes** or press **Alt Y** to save the changes to the hard disk and to close the window automatically. Click on **No** or press **Alt N** will return to the Account Code Setup window. If you do not want to save the changes previously entered, press **Esc** or double click on the close box to exit. Repeat the same steps to exit the Account Code Range window.

Note: The Account Code and description appears in the Account Code Report.

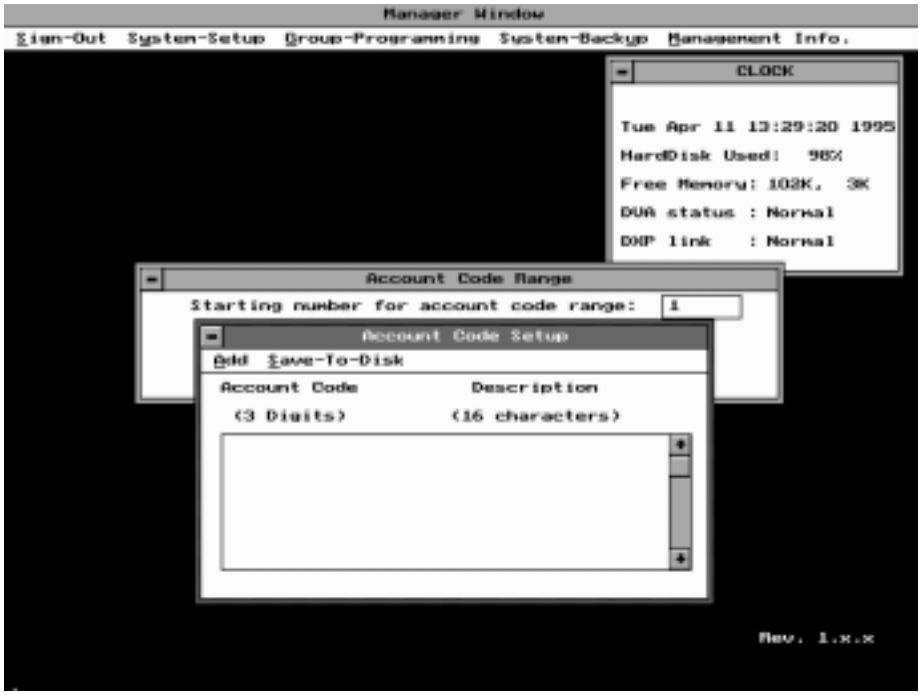


Figure 3.10. Account Code Setup Window

Arranging The Stat-Bins

QuickQ has six levels of stat-bins for answered and abandoned call statistics. Use the following procedure to setup the time bins that are used to collect the system statistics.

1. Pull down the `System-Setup` menu and select the `Stat-Bin` option.

2. A pull down menu appears with `Answer Bin` & `Abandon Bin`.

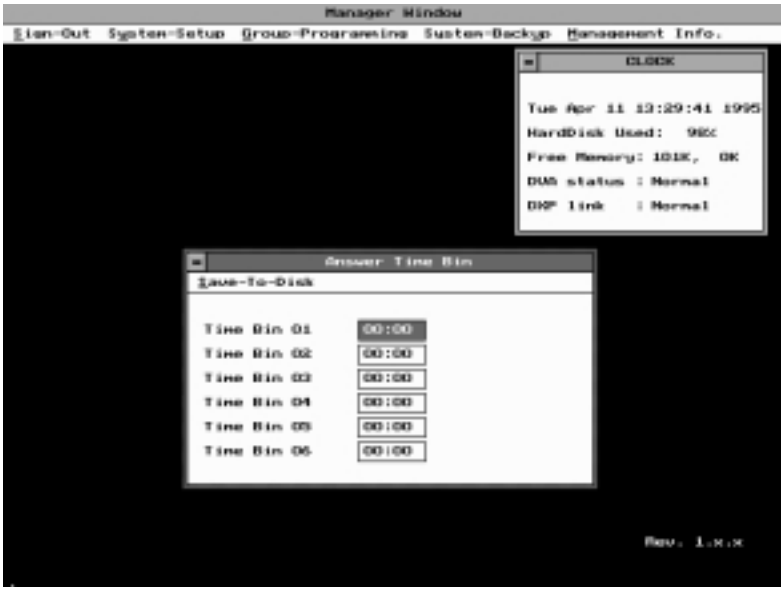


Figure 3-11. Answer Time Bin Window

3. Select *A*`Answer Bin` *a*nd th*e* Answer Time Bin window appears. Highlight the Time Bin 01 box (Figure 3-11).

4. Type the time bin parameters in minutes and seconds. Repeat for all remaining time bins. You can move from one time bin to another by pressing Enter. Save the newly entered data by clicking on the `Save-To-Disk` menu bar item.

5. The Save Answer Time Bin window with `Yes` and `No` option appears. Click on `Yes` or press **Alt Y** saves the data entered and closes all windows. Click on `No` or press **Alt N** closes the Save Answer Time Bin window and returns to the Answer Time Bin window. Press **Esc** or double click on the close box to exit this window.

6. Pull down the `Stat-Bin` menu and select `Abandon Bin` option. Repeat step 4. The Save Abandon Time Bin window appears after selecting `Save-To-Disk` on menu. Click on `Yes` or press **Alt Y** saves the data entered and closes all windows. Click on *No* or press **Alt N** closes the Save Answer Time Bin window and returns to the Answer Time Bin window. Press **Esc** or double click on the close box to exit this window.

Programming Group Levels

By System Manager

Group Supervisors can only alter the parameters for their particular group but System Managers can use this procedure to change any of the settings for any of the groups.

1. Select the `Group Programming` from the Manager window menu bar. A pull-down menu appears with the names of all the groups on the system (Figure 3-12).

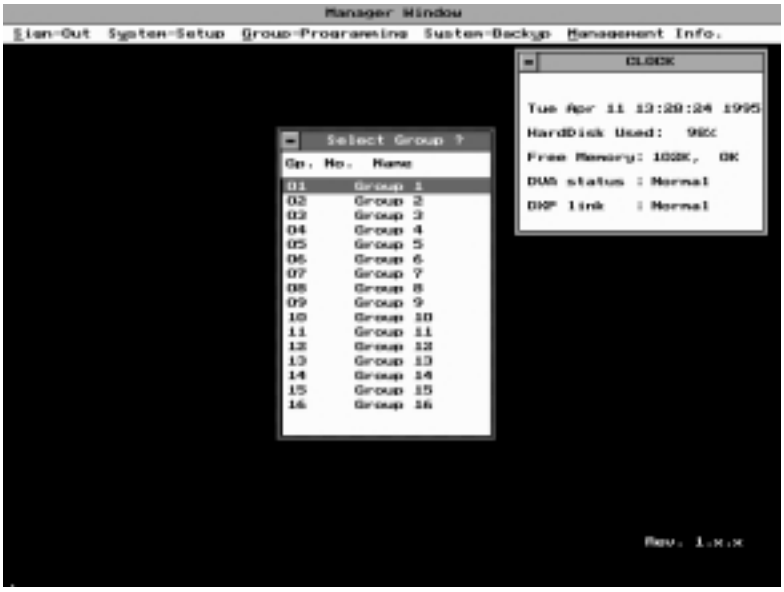


Figure 3-12. List of System Groups

2. Select the group you require (either highlight it and press **Enter** or click on it with the mouse). A small window appears offering you the chance to either sign through to that group or to abandon the action. Select the action you wish to perform by clicking on the appropriate button.

3. No further action takes place if you select `No`; however, you can choose another option from the Manager window menu bar.

4. If you select `Yes`, the system puts you at the Manager/Supervisor level. The screen will change to the Supervisor screen where you will have access to all of the group Supervisor facilities. (These are described in the Group Level Programming By Supervisor).

5. When you sign out from the Manager/Supervisor level, the system returns to the normal Manager level. To log out from the system, make sure you are at the Manager window (and not at the Manager/Supervisor window), and select the `Sign Out` option from the menu bar. The system then displays the Sign In window showing the `Sign In` option menu bar. The system is now ready for the next person to sign into the *QuickQ* system.

By Group Supervisor

As a Group Supervisor, you must sign into the system using the following procedure.

1. On the main system window, select the Sign-In menu bar option. The system Access window appears. The Group Supervisor's default ID# and password are follows: 901 for group 1, 902 for group 2, and so on through 916 for group 16. If you experience difficulty, verify ID and password numbers with the System Manager.

2. Press Enter of click on Select at the Supervisor/Manager Sign-In Window.

3. Once you have signed into the system, the Supervisor window appears and the main menu bar displays five options:

- Group Setup
- Agent Group Setup
- Line Group Setup
- Management Info.

From here, you can set certain parameters for your group and examine the Management Information System reports.

Preparing The Group Layout / Worksheet

Always prepare your Group Supervisor's programming worksheet before you begin configuring the group at the console. Refer to Appendix C of this publication for the Group Supervisor's Programming Worksheet.

Configuring The Group

Use this procedure to configure your group parameters:

1. Select `Group Setup` from the menu bar. The Group Setup window (Figure 3-13) appears and shows the group name in the title bar. The screen also displays the default settings for a variety of parameters. Continue with step 2.

2. To change the overflow threshold, move the highlight to the top box, and enter the new time in place of the old time. This programming action sets the time that a call waits before the system transfers it to the overflow groups.

3. Repeat step 2 to set the Redirect Threshold (Time). Always set this time to less than one minute (the default time is 20 seconds). If a call is ringing beyond the Redirect Threshold time, the system will transfer the call to another agent. At the same time, it will also make the previous agent Busy, so calls will not be directed to this agent.

4. The Alarm Threshold (Time) is a preprogrammed time parameter to monitor the number of calls waiting in queue (default period is 45 seconds). When the Alarm Threshold (Time) works together with the Alarm Threshold (Calls in Queue), the audible alarm will trigger on the Agents' sets.


Manager -> Group 1
Sign-Out Group-Setup AgentGroup-Setup LineGroup-Setup Management Info.
CLOCK
Group-Setup: Group 1
Save-To-Disk
Threshold (min:sec)
1. Overflow Threshold : 00:00
2. Redirect Threshold (Time) : 00:20
3. Alarm Threshold (Time) : 00:45
4. Alarm Threshold (Calls In Queue) : 0
5. Priority Override (Time) : 02:00
Mode of Operation
1. Call Screening : Yes No
2. Automatic Force-Call : Yes No
3. Manual Answer : Yes No
4. Day to Night Mode : Yes No
Time for Day to Night Mode : 17:30

Figure 3-13. Group Setup Window

5. The `Alarm Threshold (Calls In Queue)` specifies the number of calls exceeding the Alarm Threshold Time before the audible alarm is triggered. To disable the audible alarm, set this parameter to 0. If you wish to primarily use the `Alarm Threshold (Time)` to trigger the alarm, set this parameter to 1.

6. The `Priority Override` time determines how long a low priority call remains in queue before the system promotes it to the highest priority. This is useful when a number of high priority calls are coming in and a low priority call has been waiting for some time.

7. If you set the Call Screening field to Yes, the system forces all callers to listen to the entire first message. This action reduces the number of calls that require personal assistance by providing the information on the first message.

8. Use the Automatic Force Call field when the Agents are using a headset. The system sounds a tone in the Agent's headset and connects the call. The default setting is No. The action provided by this feature is the opposite of Manual answer. Therefore, if you set this option to No, the system automatically changes Manual answer *to* Yes.

9. Manual Answer mode is used when agents have to answer calls with the handset. When the Automatic Force-Call is changed to No, this option will be set to Yes ***automatically.***

10. Day to Night Mode specifies whether the system will automatically switch to night mode at the specified Day-to-Night Mode time.

11. Enter the time for Day-to-Night Mode in the last box. This time is based on a 24-hour clock.

12. After finishing with the Group Setup window, use the Save-To-Disk option on the menu bar before you close the window.

13. The Save Group Setup window appears. Select Yes or press **Alt Y** to save and close the windows automatically. Select No or press **Alt N** to close the Save Group Setup window and return to the Group Setup window. Press **Esc** or double click on the close box to exit.

Configuring the Agent Group-Setup

Use this Agent group setup procedure to assign agents to the Agent sub-groups, to remove Agents from a group, and to set or change Agents' ID#, password, priority and wrap-up times. Agents may be assigned to one of four Sub-groups. These Sub-groups are used for statistic purposes only. (For example: Subgroup 1 contains all full-time staff, subgroup 2 are all part-time staff, etc.) Calls will be distributed to all agents in all subgroup evenly.

1. Select Agent Group Setup from the menu bar, a pull down menu appears with 4 Agent Groups. Select the sub-group you wish to work with and the Agent Group Window appears. The scrollable area (the area with scroll bar on the right edge) contains the Agent details. If there are no agents in the group, this area is blank (Figure 3-14).

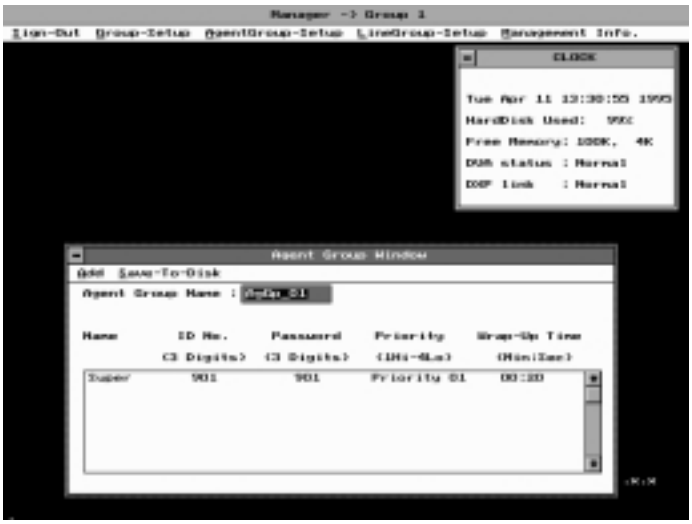


Figure 3-14. Agent Group Window

2. If the selected subgroup does not exist, the Add Agent Group Window will appear. Select Yes or press **Alt Y** creates the subgroup and opens the Agent Group Window.

3. To add an agent, select Add from the menu bar. The Add Agent Window appears at the top of the screen (Figure 3-15).

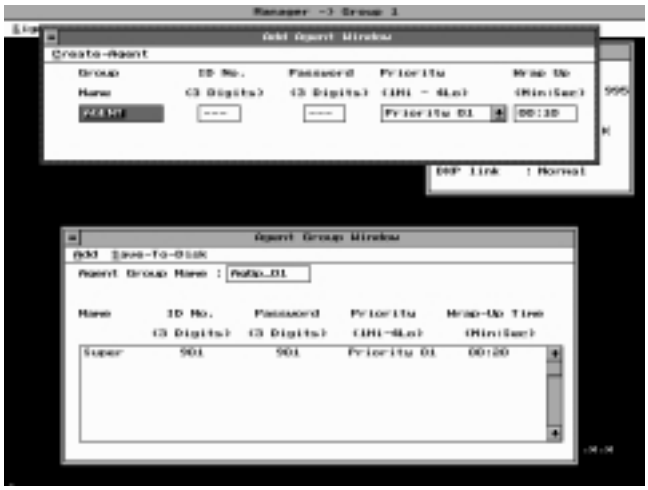


Figure 3-15. Add Agent Window

4. Type the name of the Agent at the AGENT default entry.

   Note: If you are using the keyboard, use the **Tab** *key to move from field to field. If you are using the mouse, click on the field you wish to work with.*

5. Enter the `ID#` ***and*** `password` for the Agent. When you are in the `Priority` field, press **Enter** or click on the arrow icon, and a drop-down menu appears. From this menu, select the priority for the Agent (Priority 01 is the highest and 04 is the lowest. When a call comes in, it will first be sent to agents with the highest priority). Enter the wrap-up time (in minutes and seconds) in the Wrap Up field (Wrap-up time provides the agents a short break to finish off their paper work before they are assigned another call).

6. After you have entered all Agent details, select the `Create-Agent` from the menu bar. The Add Agent Window appears prompting you with `Yes` or `No`**.** Select `Yes` or press **Alt Y** will add to the agent list and return to the Add Agent Window. If there is no more entry, press **Esc** or click on the close box to exit the Add Agent Window.

7. If you wish to change or delete an Agent entry from the sub-group, highlight it and press **Enter** or click on it with the mouse. The Edit Agent Setup window appears, and provides two options on the menu bar, `Up-Date` and `Delete`**.** After changing the agent information, select `Update` or press **Alt U.** The Update Agent Information window appears with `Yes` and `No` option. Select `Yes` or press **Alt Y** saves the changes made. The Edit Agent Setup window and the Update Agent Information window closes automatically. Select `No` or press **Alt Y** closes the Update Agent Information window and returns to the Edit Agent Setup window.

   Note: Press `Enter` *to move the cursor from the* `Agent Group Name` *to the Agent in the scrollable area.*

8. If you wish to delete the agent from the sub-group, click on the `Delete` option or press the **Alt D** key. The Delete agent from sub-group window appears. Select `Yes` or press the **Alt Y** to delete the agent from the Agent Group list. The Delete agent from sub-group window and the Edit Agent Setup window closes automatically.

9. After entering all agent information, select `Save-To-Disk` on the menu bar or press **Alt S.** The Save Agent Group window appears with `Yes` and `No` prompt. Select `Yes` or press **Alt Y** saves all information to the hard disk and closes the windows automatically. Select `No` or press **Alt N** closes the Save Agent Group window and returns to the Agent Group Window. Press **Esc** or click on the close box to exit.

Configuring the Line Group-Setup

During installation, the technician assigns the lines to different Subgroups e.g. local lines will be grouped in one Subgroup and In wats lines will be grouped into another Subgroup**.** `LineGroup-Setup` is used to set up various parameters for the line groups. It provides end users flexibility of assigning different messages and priority levels to the different Subgroups. Use this `LineGroup-Setup` procedures to configure parameters for the installer-assigned line groups

1. Select `Line Group-Setup` from the menu bar, and select one sub-group from the drop-down menu. The Line Group window opens with the title of the line group in the title bar (Figure 3-16). If the selected Line Group does not exist, the Add Line Group Window appears. Select Yes or Press Alt Y to create a Line Group and the Line Group Window appears.

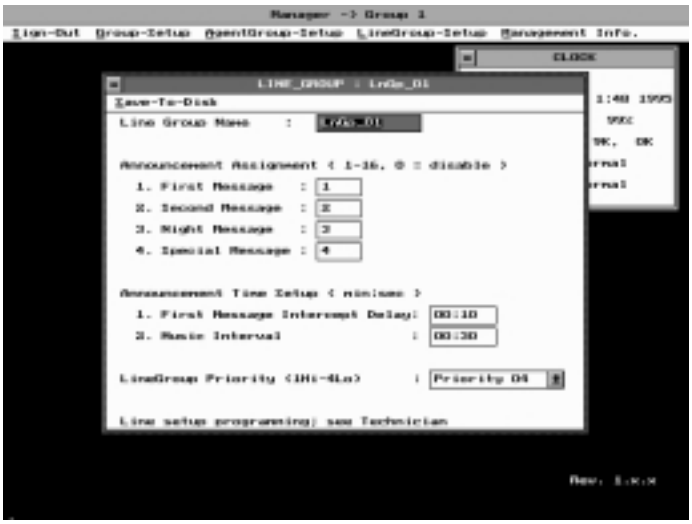

Manager -> Group 1
Sign-Out Group-Setup AgentGroup-Setup LineGroup-Setup Management Info.
CLOCK
LINE_GROUP : LnGp_01
Save-To-Disk
Line Group Name : LNGP_01
Announcement Assignment (1-16, 0 : disable)
1. First Message : 1
2. Second Message : 2
3. Night Message : 3
4. Special Message : 4
Announcement Time Setup (minisec)
1. First Message Interrupt Delay: 00:10
2. Music Interval : 00:30
LineGroup Priority (Hi-Lo) : Priority 04
Line setup programming: see Technician
Rev. 1.x.x

Figure 3-16. Line Group Window

Note:If you open a non-existing Line Group b by mistake,always select **No** *or press* **Alt N**. *Once you create a new Line Group,it cannot be removed-lf the line Group created will appear on aIl Line Group reports. However, this will not affect normal operation.*

2. To change the name of the line group, highlight the Line Group Name box and begin typing.

Note: If you are using the keyboard, use the **Tab** *key to move from field to field and you are using the mouse, click on the field you wish to work with.*

3. You can specify which messages (16 available messages)the system will use. If all agents are busy, the first message offers an introductory message and put customers on hold. The second message reassures customers that an agent will be with them shortly. The default is messages I and 2 respectively.

4. The system plays the night message while *QuickQ* is in night mode, and disconnects the caller at the end of the message. The default for &s message is 3.

5. The system plays the special message in unusual circumstances and disconnects the caller at the end of the message. Special message can be used in emergency situations such as power failure, bomb threat if the office has to close early. When the system switches to night mode, the special message or system switch automatically changes to night message.

6. The First Message Intercept Delay is the time between when *QuickQ* answers the call and plays the first message to the caller since all agents are busy. Enter this time in minutes and seconds (default equals 10 seconds).

7. The Music interval is the time between messages(between the first and second. and between repeats of the second message). Enter this time in minutes and seconds (default equals 30 seconds).

8. Establish the line group priority. Click on the arrow icon or press Enter to open a drop-down menu. Use this menu to choose a priority level (01 is the highest priority and 04 is the lowest priority). Priority lines are usually assigned to in wats lines to cut down long distance cost.

9. When you have finished setting the parameters, save your changes by selecting the save-To-Disk option from the menu bar. The Save Line-Group Changes window appears. Select **Yes** or press **Aft Y** to save and close the windows.

Understanding the Messages

The *QuickQ* system can store up to 16 messages. The Message window (refer to *Setting Announcement Titles* on Page 3-9) allows you to view the length and number of these messages. You can enter a description to label each one if you wish.

The Current setting shows the length of the message in minutes and seconds. The Limit setting shows the time available for the message. *QuickQ* allows a total of 320 seconds of message recording time.

If you plan to frequently change the messages, record a blank message with enough recording time for future changes. Refer to the discussion titled *Recording Announcement Message and Playback* in the *QuickQ* operation section of this guide for message recording and playback information.

Management Information

QuickQ provides both real time and historical statistical information on the performance of the call center. Supervisors can select `Management Info.` from the menu bar and a drop down menu with the following 5 options appears:

- Real Time-Setup
- Real Time
- Historical
- Current
- Configuration

Refer to Section 5, Management Information for further details.

System-Backup

The *QuickQ* automatically stores all Programming changes and Statistical Data to the P.C.'s hard disk. The System - Backup option provides a method to back-up data, onto floppy disk. This ensures safe storage of the Digital Announcement Messages, the Configuration Parameters and the Statistical Reports. It is a good practice to always back-up an), changes to messages and configuration programming-, thus., protecting against interruptions in power, hardware failures and inadvertent deletion of information, QuickQ is equipped with sufficient memory to store several years of Statistical Reports. However, Statistical Reports should be backed-up every 3-4 months. Delete all unwanted reports and save to floppy disk important data for storage. This will ensure optimum efficiency of the hard disk, protect important data and ensure the hard disk has sufficient space to store future data.

Announcement Backup

To back up the messages, perform the following procedure-

1. Select `System-Backup` from the Manager Window main menu and a drop down menu with the following three options appears:

Announcement Backup

Configuration Backup

Stats Backup

2. Select A n n o u n c e m e n t B a c k u p and the Message Backup and Restore window appears (refer to Figure 3-17).



Figure 3-17. Message Backup and Restore Window

3. Use the Backup button to send the current DVA messages to the floppy disk. The Restore button retrieves the DVA messages from the floppy disk to the hard drive.

Note: Use the **Tab** *key to move from the Backup button to the R e s t o r e Button. The messages are backed up to the 3.5–inch.floppy disk drive in the DVA, not the floppy disk drive in the call processor-Install the correct floppy disk in the DVA drive before you start a backup or restore action.*

Configuration Backup

1. Select `Configuration Backup` on the System-Backup pull down menu. The System Program Back-up/Restore window appears. Refer to Figure 3-18.

2. Select the B a c k up button to send the current System Programs to the floppy, disk. The Back up to Floppy window appears with Yes and No option. To initiate the backup process, press **Alt Y** or use your mouse to click on **Yes**.

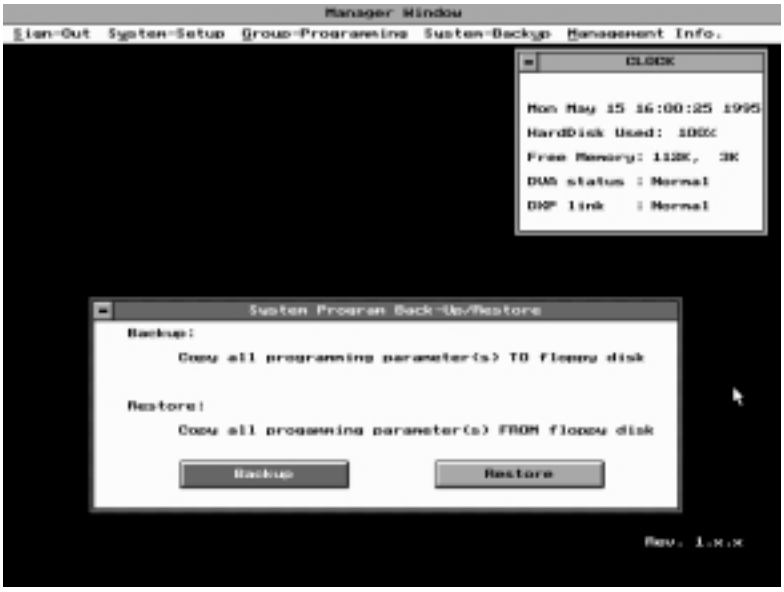


Figure 3-18. System Program Back-up/Restore Window

3. To restore System Programs, select the Restore button. The Restore Window, appears with two options: Continue and Cancel. Selecting `continue` resets the system before the data is restored.

Stats Backup

1. Select `Stats Backup` from the `System-Backup` pull down menu, the Report Back-Up/Clean-Up window appears. Refer to Figure 3-19.

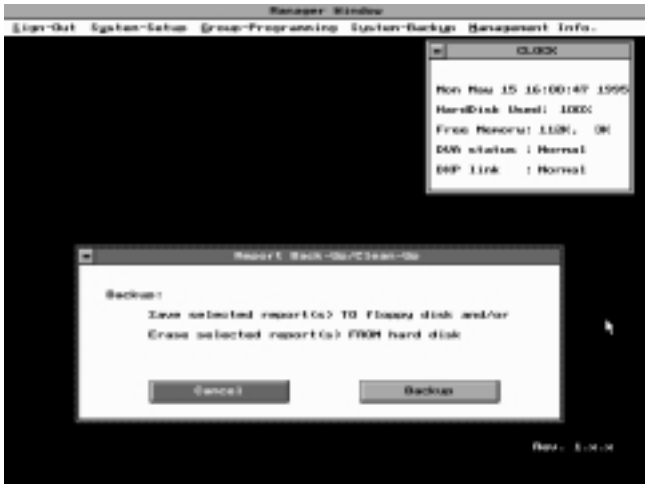


Figure 3-19. Report Back-Up/Clean-Up Window

2. Use the **Tab** key to move from the `Cancel` button to the `Backup` button. Select `Cancel` exits this function and closes the Report Back-Up/Clean-Up window. When selecting `Backup`, the Report Backup/Cleanup window appears. Refer to Figure 3-20. Select the `Continue` button to initiate the Report Back-Up function. Refer to Appendix E, Backup Utility section for details.

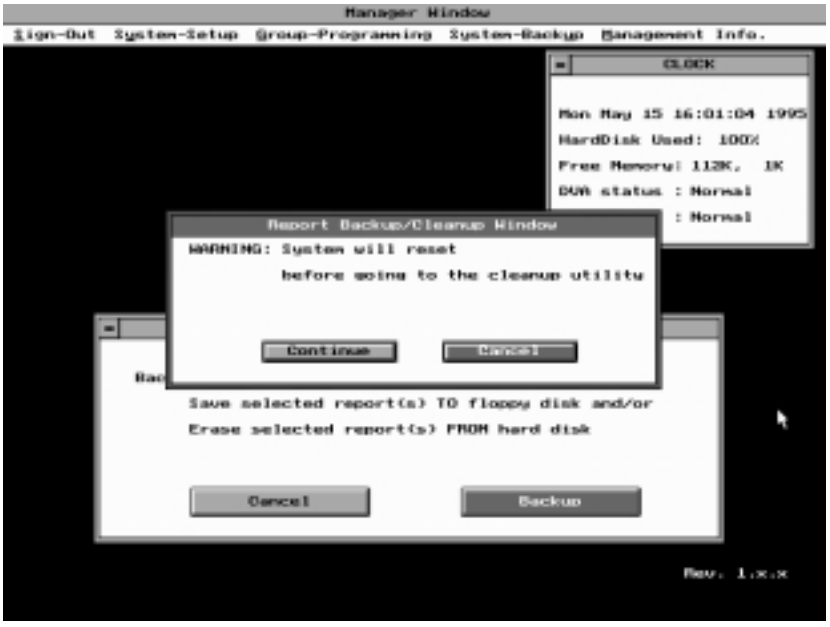


Figure 3-20. Report Backup/Cleanup Confirmation Window

Operating the QuickQ System

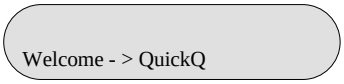
Logging In and Out of QuickQ

The following Log-In and Log-Out procedures apply to both Agent and Supervisor. They differ in the following areas:

- ID# and password are different,
- Agents can log into several groups at once,
- Supervisors can choose whether to receive calls or not.

Follow this procedure to log into the system.

1. Press the `QuickQ` button on the telephone and the following screen will appear. This display notifies you that you are about to log into *QuickQ*.



2. Type your three digit Agent ID number. If you enter an incorrect Agent ID number, press the **RETRY** interactive button and enter the correct ID number, or use the **QUIT** interactive button to exit the Log-In procedure.



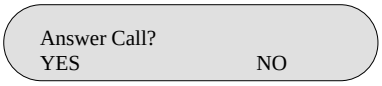
3. Type your Agent `password.` Remember, use **RETRY** or **QUIT** if necessary.



4. ***For Agents***:
   The system asks the agents to log into the appropriate group. If the supervisors has assigned you to multiple groups, use the displayed screen to locate the group into which you wish to log. Press the **IN** interactive button to log into the displayed group. The system displays your next group. You can press the **IN** interactive button to log into that group or press the **SKIP** interactive button to display the next group after that and so on. Alternately, press the **ALL** interactive button and log into all of the groups at once.



For Supervisors:
The system presents supervisor with a screen that asks if they wish to accept calls or not. Respond by pressing either the **YES** or **NO** interactive button.

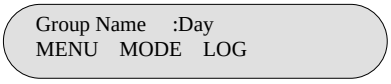


5. The following screens indicates you are now ready to accept ACD calls:

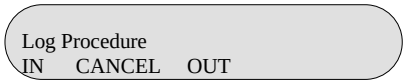
For Agents:



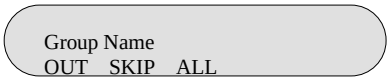
For Supervisors:



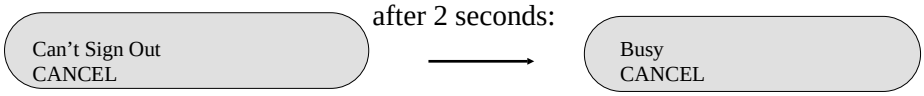
6. ***For Agents logged into one group:***
You can log out from *QuickQ* while in the Ready, Busy or Wrap-up modes. To do this, press the **LOG** interactive button. You are now in the Log Procedure, press the **OUT** interactive button to log out.



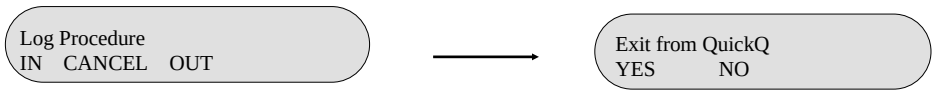
For Agents logged into multiple groups:
After you press the **OUT** interactive button from the Log Procedure, the system asks which group you wish to log out from. You can press the **OUT** interactive button to log out of the group shown on the display. You can press the **SKIP** interactive button to display the next group. Press the **ALL** interactive button to log out of all the groups that have more than one agent.



The last agent cannot log out of *QuickQ* if the group is in day mode. The following screens will appear:



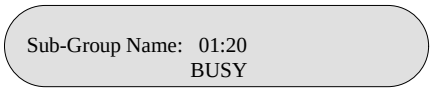
For Supervisors:
Press the **LOG** interactive button will bring you to the Log Procedure. Then press the **OUT** interactive button. The screen will ask whether you want to exit *QuickQ*. Press the **Yes** interactive button to exit.



Operating As An Agent

Answering Automatically

In the automatic answer mode, with a headset enabled, when a call arrives at your telephone, you receive a warning tone and the system automatically connects the call. Speak into the mouth-piece of the headset. The display shows the call sub-group and the length of time the caller waited to be connected.



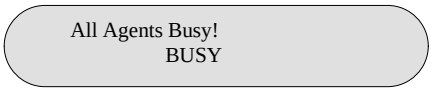
Answering Manually

In the manual answer mode when a call arrives at your telephone, the telephone will ring.

- ***Lift the handset or press the SPEAKER button to answer the call. The LCD display shows the call sub-group and the length of time the caller waited to be connected.***

Note*: Use the speakerphone option with discretion as it creates noise in the office and subjects your caller to background noise as well.*

- You may choose not to answer the call by pressing the **BUSY** interactive button. *QuickQ* will either redirect the call to another Agent, or it will show `All Agents Busy!` on the display if no one is available to take the call. If the display shows `All Agents Busy!`, you cannot make your telephone busy.



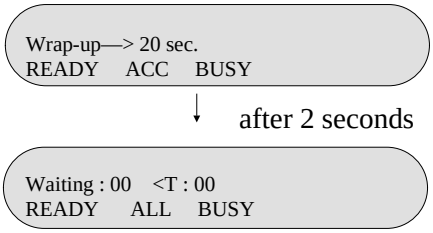
- When a call has reached the preset redirect threshold time, the system will forward the call to another agent and will make your set **BUSY** at the same time.



Wrapping Up A Call

At the end of each call the system sets aside an installer-programmed time (individually programmable for each Agent in minutes and seconds) before presenting the next call. This time allows you to finish any processing or paperwork associated with the call you just completed.

- When you disconnect the call, the wrap-up timer starts and the display shows the wrap-up time, the number of calls in queue, and the number of those calls that have waited beyond the alarm threshold.
- Either remain in wrap-up mode until the wrap-up timer expires or press the **READY** interactive button to return to Ready mode.



Making Your Telephone Busy

You can arrange your telephone to be unavailable to answer calls (for such times as lunch and breaks).

- To make your telephone busy, press the **BUSY** interactive button.
- To return to the ready mode, press the **CANCEL** interactive button.



Requesting Help

When necessary, you can use this procedure to request help from your Supervisor.

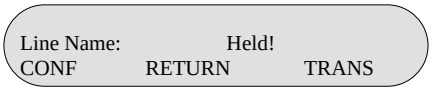
1. While engaged on a call, press the **HELP** interactive button. If the Supervisor is busy or unavailable (after 5 seconds of prompting) your telephone display shows `Supervisor Busy!`. You can either retry or cancel the request.



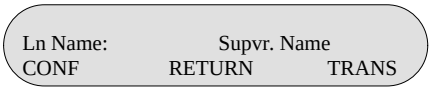
2. When the Supervisor calls you, you can either bring him or her into the call (conferencing) or put the caller on hold and speak to the Supervisor in private.



3. If you choose to speak to the Supervisor with the call on **HOLD**, you have the option of bringing in the customer into the conversation later by pressing the **CONF** soft key. Alternately, you can press **TRANS** to transfer the call to the Supervisor, or press **RETURN** to get back to the caller after receiving assistance from the Supervisor.



4. While conferencing with the Supervisor, you can press the **RELEASE** interactive button to drop the Supervisor from the call or transfer the call to the Supervisor.



Transferring Calls In or Out of QuickQ

Use this procedure to transfer calls.

1. While on a call, press the telephone's **TRANS** button.

2. Dial the intercom number of the station to receive the transfer. The system will transfer the call. After the station receiving the transfer answers the call, the system will place your station in the wrap-up mode.

Making an Outgoing Call

To make an outside call, press the **LINE GROUP** button to connect your telephone to an outgoing line, and make your call in the normal way. While on an outgoing call, you can either request help from your Supervisor, enter an account code for the call, or wrap-up the call in the same way as on an incoming call.



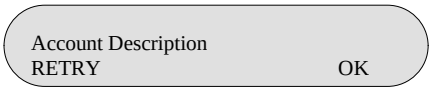
Entering Account Codes

You can use any screen that has the ACC option to enter an account code to categorize the call according to the call type.

1. Press the **ACC** interactive button at any time during the call or during wrap-up mode. Enter the three digit account code (the System Manager manages the account codes). If you enter an incorrect account code, press the **RETRY** interactive button and enter the correct account code or exit to abandon and return to the original screen.



2. Press **OK** to verify the code or **RETRY** if you enter an incorrect account code. If the code is invalid, the system prompts you to re-enter the code.



Operating As A Supervisor

As a Supervisor, you can log in at either the *QuickQ* console or the DXP telephone.

Changing the Mode of Operation

There are three distinct answering modes—Day, Night and Special.

- Day Answering Mode—The system answers with the day message, places calls on hold and distributes incoming calls to the next available Agent. The call distribution is based on the longest idle time, or the priority of the Agent or incoming line.
- Night Answering Mode—The system answers with the night message then disconnects the caller. This mode is enabled automatically at a preset time. The system automatically logs out all agents when calls in queue have been cleared. Supervisor can change the state manually.
- Special Mode—The Group Supervisor initiates the special mode for unique situations (for example, network problems). During this mode of operation, the system answers callers with the special message and disconnects them. When the preset night mode time is reached, the system will automatically switch from special mode to night mode.

Use the following procedure to select the required mode of operation:

1. From the Supervisor's telephone, press the **MODE** interactive button.



2. Select the mode of operation from the following displayed options: DAY, NIGHT, SPECIAL. After you make your selection, the display returns to the Supervisor main menu and shows the new mode at the top right corner.



Recording And Playing Back The Announcement Message

You can use your telephone to review and change any announcement message. For messages that are to be changed frequently, record your message with a buffer. For instance, record message #1 which takes up 10 seconds, follow by 10 seconds of silence. Go ahead and record message #2. After finished recording message #2, go back to record message #1 again. In this way, customers will only hear the message, and not the blank silence following it. The blank time will be saved as a buffer for future usage. If there is a change in message #1, it can be 10 seconds longer than the original message. Refer to the discussion titled Recording Announcement Message and Playback in the QuickQ operation section of this guide for message recording and playback information.

Use the following procedure to record a message.

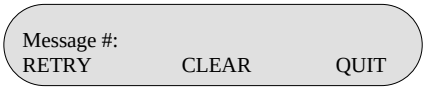
1. Press the **MENU** interactive button .

2. Press the **MSG** interactive button.



The system displays the total time remaining for the new messages.

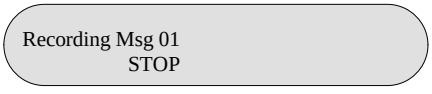
3. Dial the number of the message that you wish to record or change. For numbers lower than 10, dial a leading 0 (for example, 01–09). Press **RETRY** if you enter an invalid number, Press **CLEAR** to clear all message or **QUIT** to return to the main menu.



4. The display shows the message length in seconds (it shows 0 seconds for new messages). Press the **REC** interactive button, a tone will alert you to start recording, speak the message into the telephone handset.

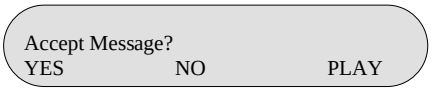


5. When you have finished, press the **STOP** interactive button, a tone indicates the end of the recording.



Note: If possible, record all of the messages as a group. If you do re-record a message, the new message must be the exact length as it was before or you will record over the next message. For example, if you replace a 15 second message with a 20 second message, you will record over the next message.

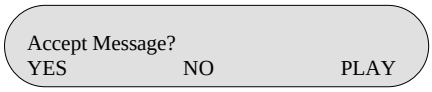
6. To review the message, press the **PLAY** interactive button.



7. The system plays the message through the handset.



7. Press **YES** to accept the message or **NO** to re-record the message.



Monitoring The Agents

You can monitor an Agent's activity status or telephone conversation. The activity status names the Agent and details the following status items:

- engaged on an incoming call,
- engaged on an outgoing call,
- engaged in Make Busy Mode,
- idle
- ready to receive a call.

Use this procedure to monitor a particular Agent:

1. Press the **MENU** interactive button.



2. Press the **AGENT** interactive button.



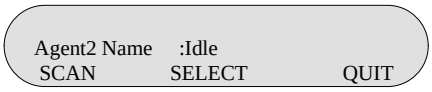
3. Dial the ID# of the Agent you wish to monitor or press **SCAN** and let the system select an Agent number for you.



4. Press the **SELECT** interactive button to monitor the Agent's call.



5. Press the **SCAN** interactive button to monitor another system selected Agent or press **QUIT** to return to step 3.



6. Press **QUIT** again to return to the Supervisor's menu.

Viewing The Current Call Statistics

QuickQ causes your LCD speakerphone to display the current number of answered and abandoned (lost) calls within a group.

Use this procedure to view the call statistics.

1. Press the **MENU** interactive button.

2. Press the **REPORT** interactive button.



Your LCD speakerphone displays the number of answered and abandoned calls.

3. Press **QUIT** to return to Supervisor menu.



Management Information

The System Manager can obtain a detailed printout of the system configuration for the manager level, the technician level, the supervisor level, or for each individual group.

When someone selects the `Management Info.` menu bar option, the system presents a menu that has several options. The menu offers the following options:

- `Real Time-Setup` (For Supervisor)
- `Real Time`
- `Historical`
- `Current`
- `Configuration`

Selecting The Real Time Report

Viewing The System Manager Real Time Report

The System Manager's real time report shows information in the System Agent Status window and the System Line Status window. Refer to Figure 5-1. System Manager Real Time Report. The system continually updates these windows in approximately 3 second intervals so that they reflect current line activities and statistics of both the Agents and the lines.

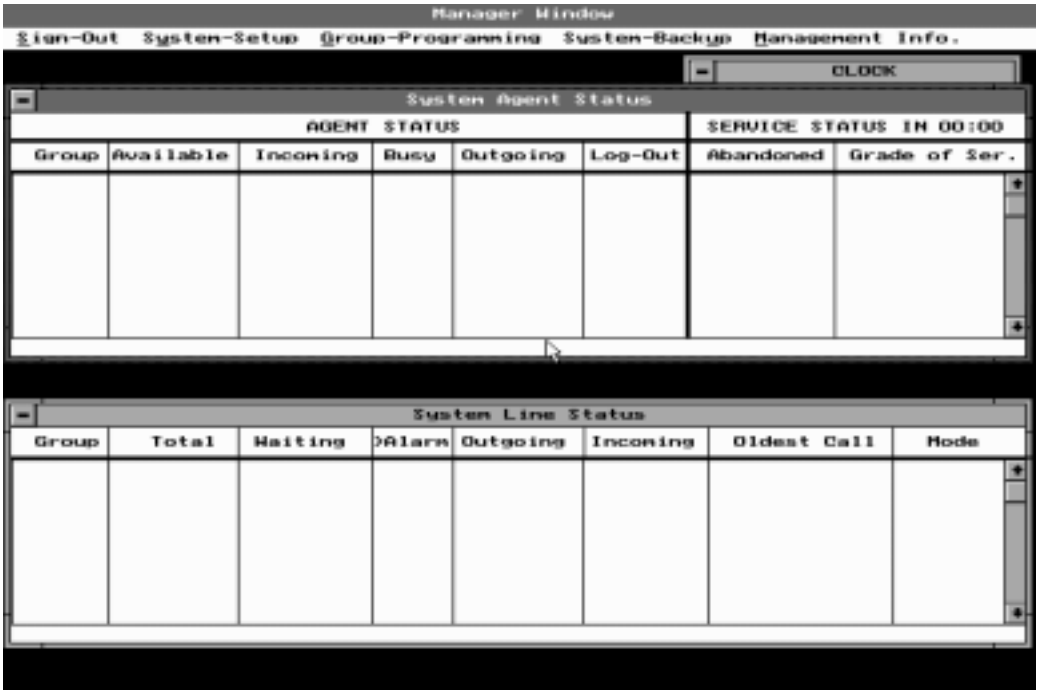


Figure 5-1. System Manager's Real Time Report

The System Agent Status window shows the following items:

- group number,
- Numbers of Agents in that group currently available,
- number of Agents on incoming calls,
- number of busy Agents,
- number of Agents on outgoing calls,
- number of Agents who are logged out from that group,
- number of abandoned calls,
- grade of service being offered to callers.

The System Line Status window shows the following items:

- group number,
- number of available lines,
- number of calls waiting on the lines for the group,
- number of calls which are over the alarm threshold,
- number of outgoing calls,
- number of incoming calls,
- oldest call in the system,
- mode of operation.

Selecting The Real Time Set Up Parameters

The system also makes a real time setup option available. With it, Group Supervisors can set a threshold time for incoming calls, outgoing calls, and busy status. When an Agent exceeds the threshold time, the system highlights his or her name with the color red on the real time report screen.

1. Pull down the `Management Info`. menu and select the `Real Time Set-up` option. The Real Time Parameter Set up window appears (Refer to Figure 5-2). To move from field to field, use the **Tab** key or press `Enter`. After editing the parameters, select `Save-To-Disk` or press **Alt S**. The system saves the changes and closes the window automatically. If no changes are necessary, press `Esc` or double click on the close box to exit.

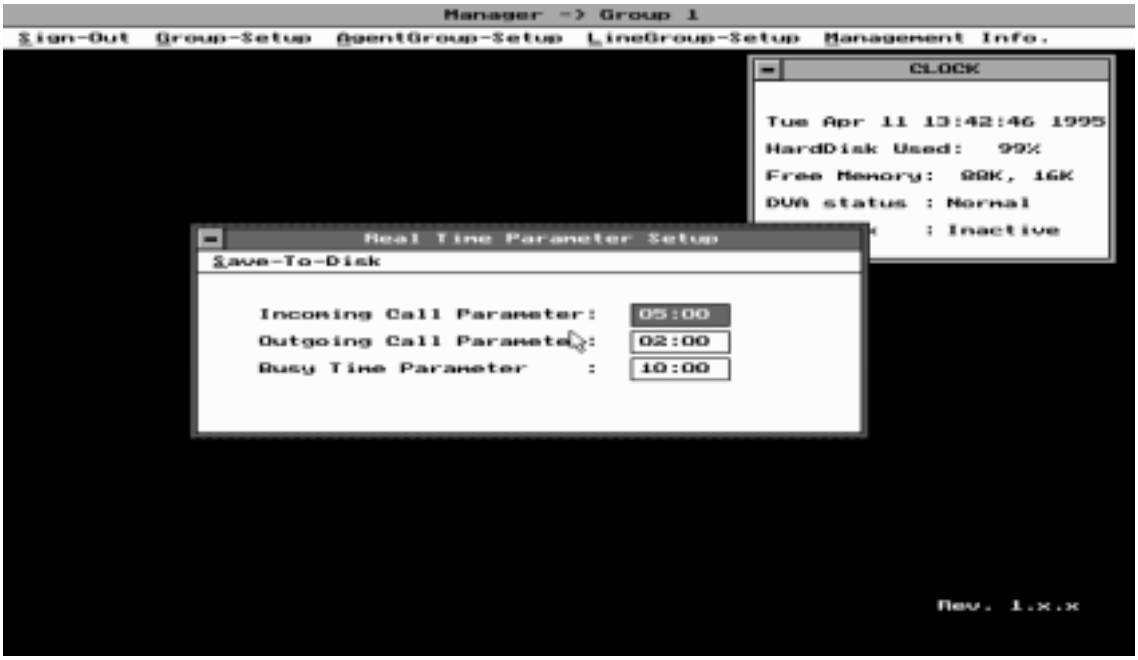


Figure 5-2. Real Time Parameter Setup

Viewing The Supervisor's Real Time Report

The system updates the Supervisor's real time report (refer to Figure 5-3) in approximtely 3-second intervals so that the report continually monitors the group's current call activities and statistics. In addition to continually updating the service status window, the system restarts that service window's status totals every 15 minutes. The report windows show the following items

- traffic status,
- service status,
- agent status,
- traffic activity (explanation on page 5-4),
- agent activity (explanation on page 5-4).

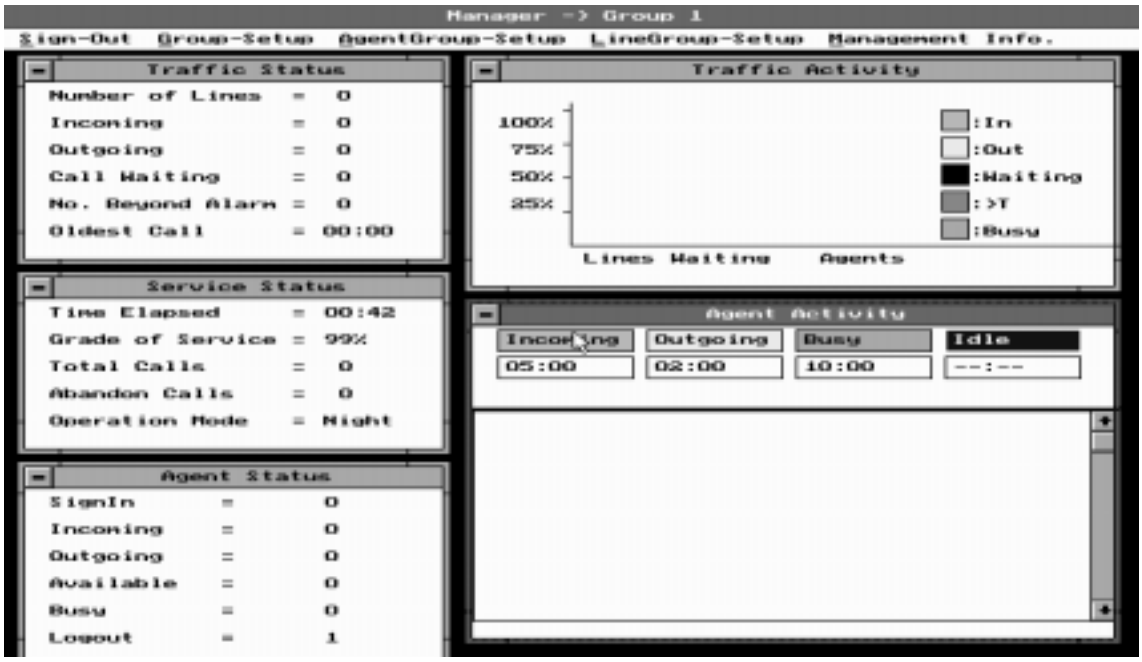


Figure 5-3. Supervisor's Real Time Report

Traffic Status Definitions

1. Number Of Lines	= line available for calls
2. Incoming	= active incoming calls (includes calls answered and waiting)
3. Outgoing	= active outgoing calls
4. Call Waiting	= calls waiting to be answered
5. No. Beyond Alarm	= calls waiting beyond alarm threshold time
6. Oldest Call	= time oldest call has waited to be answered

Service Status Definitions

1. Time Elapsed	= elapsed time since the window restarted (window details status in 15 minute blocks)
2. Grade Of Service	= see the chart on page 5-13
3. Total Calls	= total calls serviced in current window time
4. Abandoned Calls	= calls dropped by caller or connected for less than nine seconds
5. Operating Mode	= day mode , night mode or special mode of operation

Agent Status Definitions

1. Sign In	= agents signed in
2. Incoming	= agents on incoming call
3. Outgoing	= agents on outgoing call
4. Available	= agents idle
5. Busy	= make busy agents
6. Logout	= agents out of service

Traffic Activity — The Real Time Traffic Activity window shows the activity percentage for the Lines, Waiting call and the Agent. The Line indicates the percentage of activity on the lines assigned to group. The activity for the lines can be green for incoming call or yellow for outgoing call. The Waiting indicates what percentage of the incoming calls are actually waiting for an agent. The activity for the waiting call can be red for the calls past the alarm threshold (>T) or black for the calls below alarm threshold. The Agents indicates the percentage of active agents in the possible activity states. The activity for the agents can be gray for agents in Busy state, green for agents on incoming call and yellow for outgoing call.

Agent Activity — The Real Time Agent Activity window shows the current state of each agent signed in to the group. The agent's name programmed in the QuickQ is displayed in one of the four possible states. The agent can be in blue for idle state, gray for Busy state, yellow for Outgoing state or green for Incoming state. The list of names under each possible state is shown based on the longest time in the activity state. The agent's name box may changed to red under the possible states, if the time in that state has exceeded the acceptable time set for that state.

Selecting Historical Reports

Use this procedure to obtain historical reports.

1. Select `Management Info.` on the menu bar and click on the `Historical` option. The calendar appears, showing the current month, with each day represented by a button. At the bottom of the calendar window are boxes in which you can specify a new month (0 to 12) and a new year. This allows you to call up any stored data by specifying that period.

2. Select the appropriate year and month and press **Enter**. As you specify new months and new years, the calendar changes to show the month you have selected.

   Note: Use the **Tab** *key to move from* `Month` *to* `Year` *and to the calendar.*

3. Select a single day within that month either by using your `Up` and `Down` arrow key to move between days, and pressing **Enter**, or clicking on it. Alternatively, you can choose a complete week by using one of the `WEEK 01`, `WEEK 02` to `WEEK 06` buttons on the left side of the calendar, or you can choose the report on the whole month by clicking on the `Monthly` button at the bottom of the calendar or press **Alt M**. If you select a single day, a File Selections window appears. Line 00, indicated by a date, allows you to choose reports for the entire day. H00 means hour 0 and H01 means hour1 and so forth. To select numbers 01 and onwards will provide you with a report for a single hour out of that day.

4. After you choose your report period, the system shows the Main Report screen. To continue, refer to The Main Report Screens.

Selecting Current Reports

Selecting the Current option from the Management Info. menu causes the Current Report window to appear. This window features two buttons allowing you to select a series of reports for the current hour (Hourly) or the current day (Daily). After you choose your report period, the system shows the main report screen.

Selecting The Main Report Screens

The Main Report screens are the same for the daily, weekly and monthly analysis periods. While the hourly report menu lacks some of the report types offered by the other reports. The menu bar offers the report type, report format, note, and print options.

Report Type—Selecting this option from the menu bar causes a Report-type menu to drop down. The reports type consists of the following options:

- Answer Bins
- Abandon Bins
- Incoming Call
- Total Time
- Average Time
- System Capacity
- Account Code
- Traffic Analysis (Current Daily Report)

Highlight the desired report type and press **Enter**, or click on it with the mouse.

Report Format—Selecting this option causes a small two-option menu to drop down that allows you to specify whether you wish to view the currently selected report in either Numerical or Graphic format. Highlight the format you wish to use and press **Enter**, or click on it with the mouse.

Note—Selecting this option from the menu bar opens up a small window that allows you to enter free-form text. Use this opportunity to enter as a reminder of the circumstances during which the data was compiled. This is useful when you are looking at historical data and you find something unusual about the reports. Always review at the note for the old report as it may present an important message (for example, *Phone company came in to upgrade system - phones off for two hours*).

*Use the **Tab** key to cycle through the buttons until the highlight is in the main text window of the Note Window, or click on the Text area with the mouse then type your notes.*

To exit from the Note window, highlight and select the Abandon button (does not save your changes), or the Save-To-Disk option (saves all changes). Both of these options close the window.

Print—To print your report, select the Print menu bar option. The system drops a menu down that offers you the choice of printing the Numerical report, Graphic report or Both.

Choose one of the three options and the Print Report window appears offering a list of seven report types. Use the **Tab** key to cycle from the Start button to the Report Types. To select the type of report, press **Enter** and your option will be highlighted with an "X" on the left hand side. Use the **up** and **down** arrow keys to move between fields. To start printing, use the mouse to click on the Start button or press **Alt S**.

Selecting Configuration Reports

The configuration report provides a method to produce a hard-copy (printout) of all system parameters. Using this option, System Managers and Supervisors can review programmed parameters including Technician's Programming, Manager's Programming and All Group Supervisors' Programming. This feature is useful in providing Supervisors and Agents a listing of all Account Codes programmed by printing the Managers configuration.

1. Select Configuration from the Management Info. pull down menu. The Configuration Report window appears with three report types:
   - Group
   - System
   - Technician
2. Use the **Up** and **Down** arrow keys to cycle through the Report Types, your option will be highlighted on the left hand side.

   Note: Only one type of report can be selected each time.
3. **Tab** to move from the Report Types to the Group field. Press **Enter** or use the mouse to click on the arrow icon on the side. A drop-down menu appears from which you can select a specific group. Again, use the Up and Down arrow keys to move between groups. Press Enter or click on the mouse to highlight your choice.
4. To start printing Configuration Reports, use the **Tab** key to move to the Print button and press **Enter** or click on the Print button with your mouse.

Selecting QuickQ MIS Reports

The QuickQ provides comprehensive Management Information System (MIS) reports that you can either view on the call processor computer screen or print as a hard copy. The system updates and automatically stores all reports and can present the data in both graphic and numerical formats. This reported information assists the System Manager in making efficient use of lines and agents.

The system collects over 63,000 different statistics and presents them in 80 different MIS reports. The system reports are related to the following time periods:

- hourly,
- daily,
- weekly,
- monthly.

The system reports are categorized for the following four operational levels:

- The **System level** reports show data for all lines and agents on the system
- The **Group level** reports provide data for each group programmed on the system.
- The **Line level** reports provide data for each telephone line within a specific group.
- The **Agent level** reports show data for each agent in a specific group.

Viewing Typical MIS Reports

The system provides the following report formats:

- answer bins (Figure 5-4)
- abandon bins (Figure 5-5)
- incoming call (Figure 5-6)
- total time (Figure 5-7)
- average time (Figure 5-8)
- system capacity (Figure 5-9)
- account code (Figure 5-10)
- traffic analysis (Figure 5-11)


ANSWER BINS REPORT //current daily report
Report-Type Report-Format Note Print
CALLS <00:00 <00:00 <00:00 <00:00 <00:00 <00:00 >00:00
Could not find group in current report.
Rev. 1.x.x

Figure 5-4. Answer Bins

Answer Bins
Show percent of answered calls within the 7 programmable time bins.
Shows supervisors the response rates of their departments.


ABANDON BINS REPORT //current daily report
Report-Type Report-Format Note Print
CALLS <00:00 <00:00 <00:00 <00:00 <00:00 <00:00 >00:00
Could not find group in current report.
Rev. 1.x.x

Figure 5-5. Abandon Bins

Abandon Bins
Show percent of abandoned calls within the 7 programmable time bins.
Shows supervisors the tolerance of callers.


INCOMING CALL REPORT //current daily report
Report-Type Report-Format Note Print
TOTAL INCOMING_CALLS ANSWERED_CALLS ANS GOS
I/C. ANS. ABD. NIGHT DIR. ANNC. >T %
Could not find group in current report.
Rev. 1.x.x

Figure 5-6. Incoming Call Report

Incoming Calls—Line Report Definitions

1. Total I/C	**= total incoming calls**
2. Incoming Calls–ANS	= answered incoming calls
3. Incoming Calls–ABD	= abandoned calls dropped by caller or connected for less than nine seconds
4. Incoming Calls–NIGHT	= any calls at night mode (ans, abn, msg)
5. Answered Calls–DIR	= calls answered before announcement
6. Answered Calls–ANNC	= calls answered after announcement
7. Ans>T	= calls answered after programmed alarm threshold

Incoming Calls—Agent Report Definitions

1. Total Calls–ANS	= total incoming calls answered by agent
2. Total Calls–O/G	= total outgoing calls placed by agents
3. Answered Calls–DIR	= calls answered before announcement
4. Answered Calls–ANNC	= calls answered after announcement

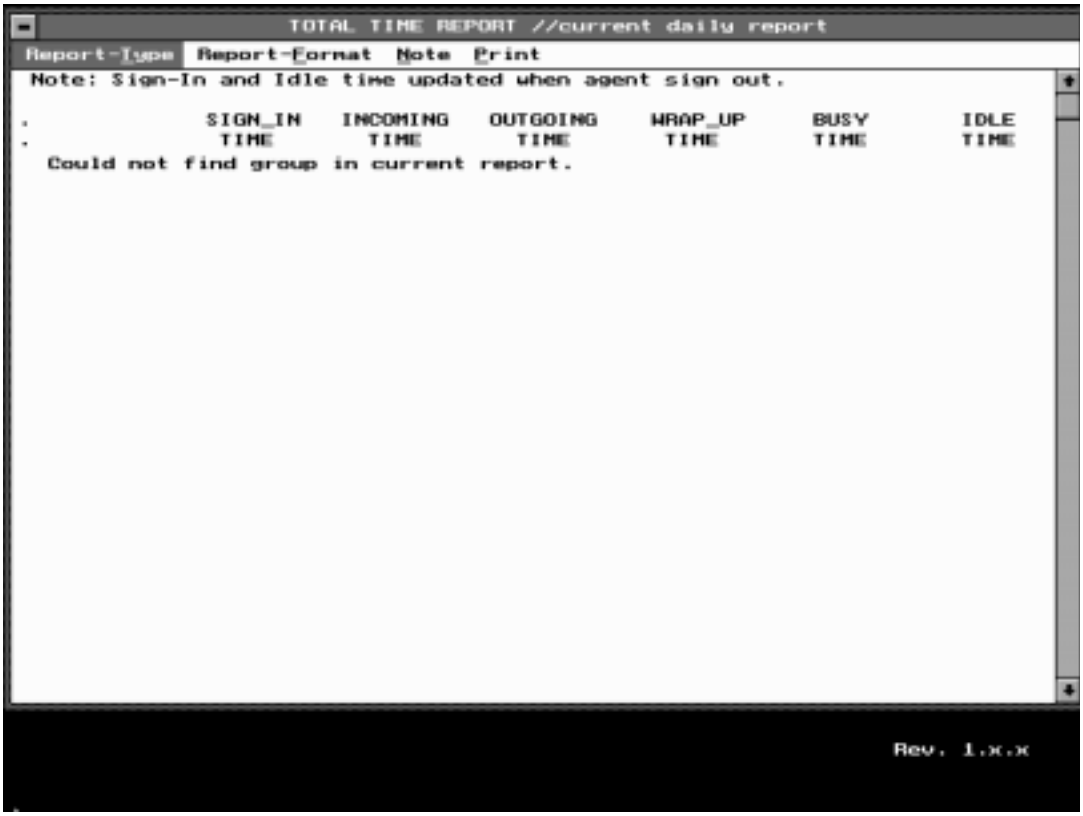


Figure 5-7. Total Time Report

Total Time Agent Report Definitions

1. Sign In Time = total agent sign in time–updated only if agent has signed out
2. Incoming Time = total time agents are engaged in incoming calls
3. Outgoing Time = total time agents are engaged in outgoing calls
4. Wrap Up Time = total time agents are in wrap-up state
5. Busy Time = total time agent set busy (agent press busy & auto busy due to redirect)
6. Idle Time = total time agents are in idle state –up dated only if agents has signed out [(1 - 2 - 3 - 4) = 6**]**

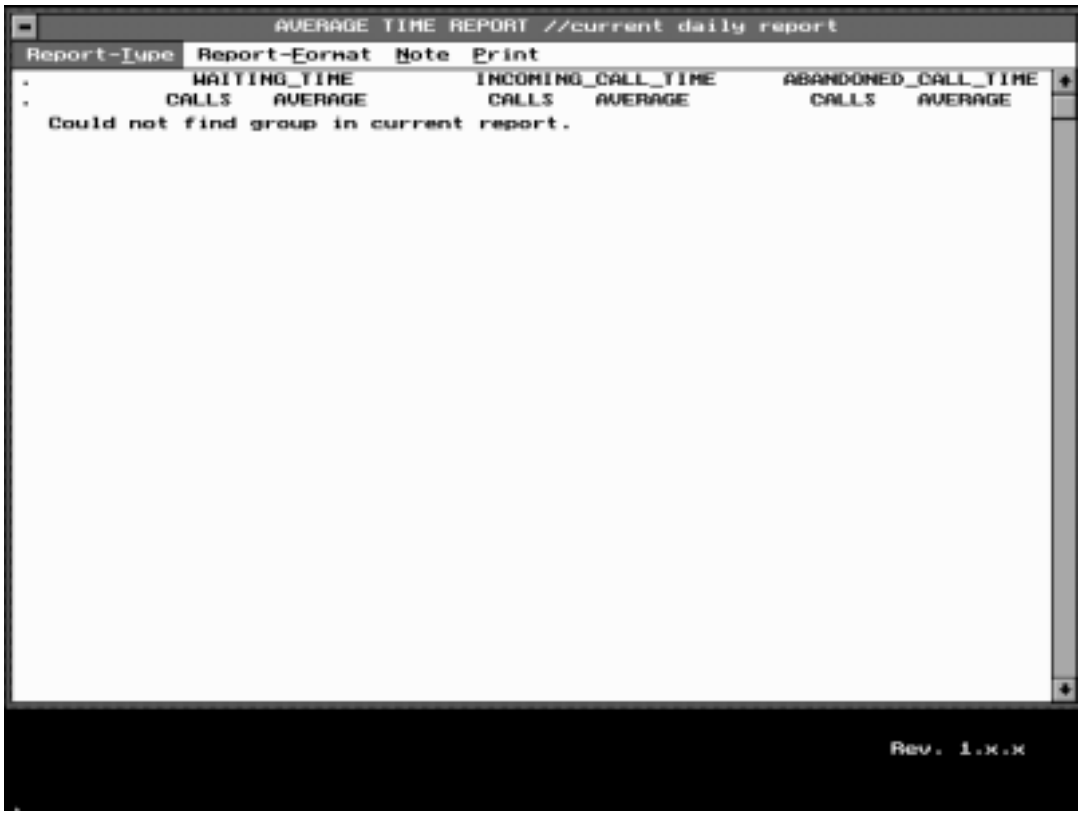

AVERAGE TIME REPORT //current daily report
Report-Type Report-Format Note Print
WAITING_TIME INCOMING_CALL_TIME ABANDONED_CALL_TIME
CALLS AVERAGE CALLS AVERAGE CALLS AVERAGE
Could not find group in current report.
Rev. 1.x.x

Figure 5-8. Average Time Report

Average Time Line Report Definitions

1. Waiting Time–Calls = number of incoming calls answered
2. Waiting Time–Average = average waiting time for each answered incoming call
3. Incoming Call Time–Calls = number of incoming calls answered
4. Incoming Call Time–Average = average connection time for each answered incoming call
5. Abandoned Call Time–Calls = number of calls abandoned–includes calls connected for less than nine seconds
6. Abandoned Call Time–Average = average waiting time for each abandoned call

Average Time Agent Report Definitions

1. Incoming Call Time–Calls = number of agent answered incoming calls
2. Incoming Call Time–Average = average connection time for each agent answered incoming call
3. Outgoing Call Time–Calls = number of agent placed outgoing calls
4. Outgoing Call Time–Average = average time for each agent placed outgoing call
5. Wrap Up Time–Call = number of times that agents are in wrap-up state [(1+3) = 5]
6. Wrap Up Time–Average = average time agents are in wrap-up state [(5) ÷ (1+3) = 6]



Figure 5-9. System Capacity Report

System Capacity Report shows the total number of times all lines were busy and the total time in hours, minutes, and seconds. It also shows the total number of times that no agent was available and the total time in hours, minutes and seconds.

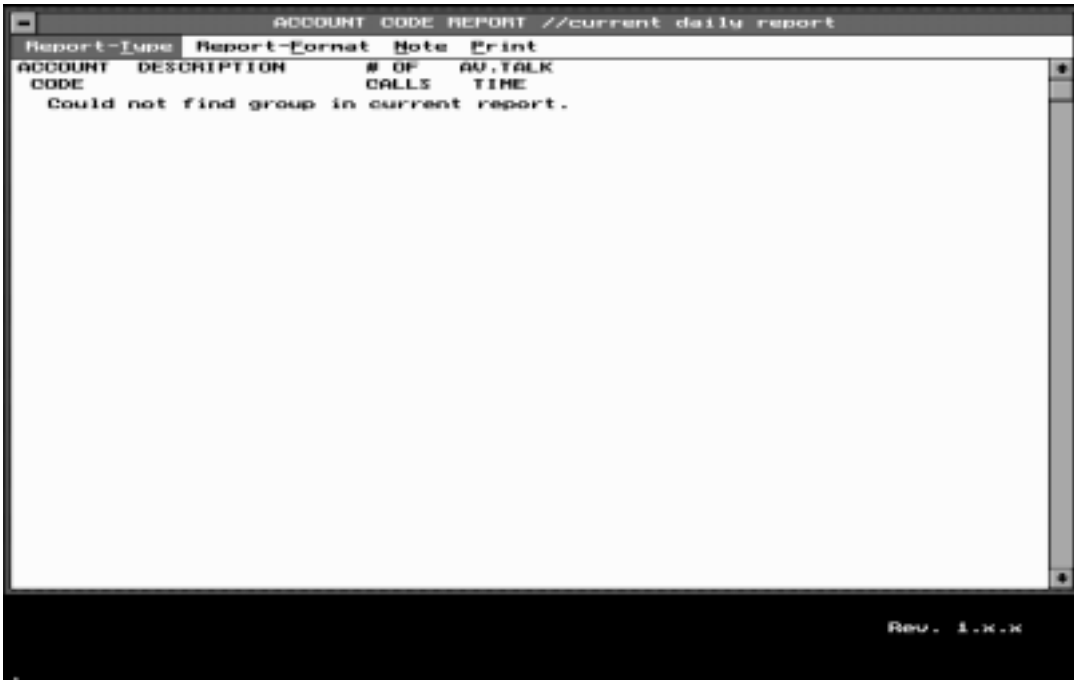


Figure 5-10. Account Code Report

Account Code Report lists the account codes with their descriptions. It also shows the number of calls logged by the agents for each Account code and the average duration of that code.

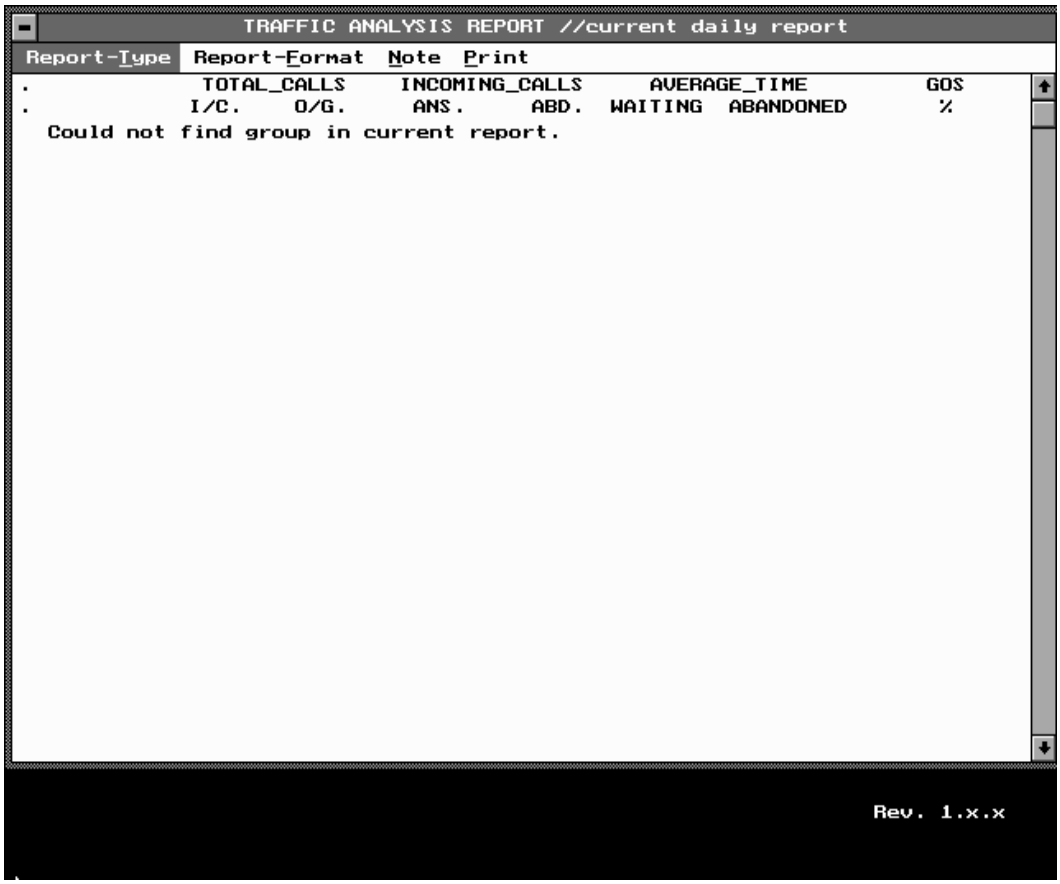

TRAFFIC ANALYSIS REPORT //current daily report
Report-Type Report-Format Note Print
TOTAL_CALLS INCOMING_CALLS AVERAGE_TIME GOS
I/C. O/G. ANS. ABD. WAITING ABANDONED %
Could not find group in current report.
Rev. 1.x.x

Figure 5-11. Traffic Analysis

Traffic Analysis Line Report Definitions

1. Total Calls–I/C = total incoming calls
2. Total Calls–O/G = total outgoing calls
3. Incoming Calls–ANS = answered incoming calls
4. Incoming Calls–ABD = abandoned calls–calls dropped by the caller or connected for less than nine seconds
5. Average Time–Waiting = average waiting time for each answered incoming call
6. Average Time–Abandoned = average waiting time for each abandoned call
7. GOS = grade of service [(3) - (number of calls answered after alarm threshold has expired, obtained from incoming call line report,)]÷ (3+4) = 7 x 100%

Appendix A

Using QuickQ With a Mouse

A mouse is a device that allows you to move a cursor on the computer screen to specific points for data entry, and other menu selections. An arrow image, called the mouse pointer, moves on the screen when you move the mouse. Practice moving the pointer. Stay away from the menu bar at the top of the screen. (If you accidentally make a menu appear, you can make it disappear by moving the pointer out of the menu and pressing and releasing the left mouse button.)

Occasionally the pointer might seem to disappear. Usually it is just off the screen. To make the pointer reappear, move the mouse in a circle a few times.

To move the mouse without moving the pointer, lift up the mouse. The pointer does not move while the mouse is in the air.

Most of the time, you use one of the following two mouse button techniques:

- clicking,
- dragging.

Clicking (Selecting an Item)

To click, press the left button and immediately release it. By clicking, you can select an item, such as a menu or an icon.

Note that the top left corner of the screen has a Sign-In label. Use it to perform the following exercise. Place the pointer at the Sign-In title and click the mouse button. The QuickQ opens the Sign-In window.

Dragging (Moving a Window)

Dragging consists of the following three steps:

- pressing and holding the left mouse button,
- moving the mouse,
- releasing the mouse button.

Dragging allows you to move the position of a Group Setup window on the screen to give yourself a better view of system set-up parameters (for example, the window and the line group window). By having both windows appear at the same time, you can identify the timing parameters that is relative to the line groups.

To move the sign-in window, place the pointer on the title bar, and drag. As you drag, an outline of the window moves with the pointer (note that the pointer changes to a hand icon). Practice moving the sign-in window on the screen.

Understanding QuickQ Window Graphics

If you are familiar with a window environment, you can skip this discussion.

QuickQ is easy to use. Most of what you see and do in the *QuickQ* console happens in a window. A window is a screen area that the *QuickQ* system uses to exchange information with you. There are many *QuickQ* windows, such as the one with which you enter your password or the one that shows line group data. You can move, re-size, overlap, close and open one or more windows in one screen. While you can have any number of windows opened, only one window can be active at a time. The active window is the one that you are currently working in. Any command you choose or text you type generally applies only to the active window. The active window may have a close box, scroll bars, and a re-size corner. If your windows are overlapping, the active window is always the one on top of all the others (the foremost one).

All windows in *QuickQ* have the following things in common:

- title bar,
- close box.
- selection key

Title Bar—The topmost horizontal bar of a window contains the name of the window. You can drag the title bar to move the window around.

Close Box—This is the box in the upper left corner. You double click on this box to quickly close the window.

Selection key —Press the **Alt** key with the underlined alphabet on the menu activates the function.

Some of the more complex windows have these additional features:

- scroll bar,
- re-size edges.

Scroll Bar—The scroll bar appears in the right side of the window. Use this bar with a mouse to scroll the contents of the window. Click the arrow at either end to scroll one line at a time (keep the mouse button pressed to scroll continuously). You can drag the scroll box at any spot on the bar to quickly move to a spot in the window relative to the position of the scroll box.

Re-size Edges—All four extreme edges of a window are the re-size edges. You can drag any edge to make the window larger or smaller.

Appendix B

System Layout / Worksheet

System Setup

Company Name

ID# and Password

	Grp. Name	Supv. Name	ID#	Password
Grp 00				
Grp 01				
Grp 02				
Grp 03				
Grp 04				
Grp 05				
Grp 06				
Grp 07				
Grp 08				
Grp 09				
Grp 10				
Grp 11				
Grp 12				
Grp 13				
Grp 14				
Grp 15				
Grp 16				

Intergroup Overflow

	Level 1	Level 2	Level 3	Level 4
Grp 01				
Grp 02				
Grp 03				
Grp 04				
Grp 05				
Grp 06				
Grp 07				
Grp 08				
Grp 09				
Grp 10				
Grp 11				
Grp 12				
Grp 13				
Grp 14				
Grp 15				
Grp 16				

Note: Group 00 refers to the System Manager's ID and Passwords, this is not one of the call processing Groups.

Announcements

Note - Space is provided on the Group Layout / Worksheet for the scripting of messages.

	Description	Group	Line Sub-group
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			

Account Codes

Code	Description

Stat-Bins

Answer Bins	**Abandon Bins**
Time	**Time**
Time Bin 01	Time Bin 01
Time Bin 02	Time Bin 02
Time Bin 03	Time Bin 03
Time Bin 04	Time Bin 04
Time Bin 05	Time Bin 05
Time Bin 06	Time Bin 06

Appendix C

Group Layout / Worksheet

Note - Make additional copies of the Group Layout / Worksheet for each of your system groups.

Group Setup

Thresholds

Overflow Time

Redirect Time

Alarm Time

Alarm (# of Calls)

Priority Override Time

Mode

Call Screening (Yes / No)

Automatic Force Call (Yes / No)

Manual (Yes / No)

Day to Night (Yes / No)

Time for Day to Night Mode (24 hr)

Agent Group Setup

Grp 01

Group Name _____

Agent Name	ID#	Password	Priority	Wrap-up

Grp 02

Group Name _____

Agent Name	ID#	Password	Priority	Wrap-up

Grp 03

Group Name _____

Agent Name	ID#	Password	Priority	Wrap-up

Grp 04

Group Name _____

Agent Name	ID#	Password	Priority	Wrap-up

Line Group Setup

Note - Space is provided on the next page for the Scripting of messages

	Grp 01	Grp 02	Grp 03	Grp 04
Group Name				
First Message #				
Second Message #				
Night Message #				
Special Message #				
Message Delay				
Music Interval				
Priority				

Management Information

Real Time Parameter Setup

Incoming Call Parameter Time	
Outgoing Call Parameter Time	
Busy Call Parameter Time	

Message Scripts

Line Group 01

First Message _____

Second Message _____

Night Message _____

Special Message _____

Line Group 02

First Message _____

Second Message _____

Night Message _____

Special Message _____

Line Group 03

First Message _____

Second Message _____

Night Message _____

Special Message _____

Line Group 04

First Message _____

Second Message _____

Night Message _____

Special Message _____

Appendix D

Reviewing The Programming Road Map

Start-up Screens

Sign-In
ID # XXX
Password XXX

Technician's Screens

System Setup
QuickQ Master Setup
Master Extension
Master 2 Extension
QuickQ OAI Key Code
QuickQ Line Setup
Name
Group
Subgroup
Line No.
Voice Port Config.
Voice Port No.
Station
Type
Printer Setup
Printer Type
Other
Epson LQ
HP Laser
HP DJ 500
HP DJ 550C
Printer Port
LPT 1

Integration Setup
External Overflow

Password
Old Password XXX
New Password XXX

Diagnostic
QuickQ Status
Agent Status Scan
Line Status Scan
Voice Port Status Scan

System Manager's Screens

System Setup
Company Name
ID Password
Group Name XXXXXXXX
Supervisor Name XXXXXXXX
ID # XXX
Password XXX
Time/Date
Date dd-mm-yyyy
Time HH:MM
Group Programming
Group 01-16
(link to group supervisor screens)
Intergroup Overflow
Group 01-16
Level 01
Level 02
Level 03
Level 04
Announcement
Message
Message 1-16
Description
Current Time MM:SS
Limit Time MM:SS
Backup
Account Code
Starting Number Range X
Account Code XXX
Description
System Backup
Stat Bin
Answer Bin
Time Bin 1 MM:SS
Time Bin 2 MM:SS
Time Bin 3 MM:SS
Time Bin 4 MM:SS
Time Bin 5 MM:SS
Time Bin 6 MM:SS
Abandon Bin
Time Bin 1 MM:SS

Management Info.
Real Time
System Agent Status
System Line Status

Historical

Current
Hourly
Report Type
Answer Bins
Abondon Bins
Incoming Calls
Total Time
Average Time
SystemCcapacity
Traffic Analysis
Account Code
Report Format
Numerical
Graphical
Note
Print
Daily
Report Type
Answer Bins
Abondon Bins
Incoming Calls
Total Time
Average Time
SystemCcapacity
Traffic Analysis
Account Code
Report Format
Numerical
Graphical
Note
Print
Configuration
Group
System
Technician
Print

Group Supervisor's Screens

Group Setup
Overflow Threshold MM:SS
Redirect Threshold MM:SS
Alarm Threshold MM:SS
Alarm Threshold Calls in Queue
Priority Override MM:SS
Call Screening Yes No
Automatic Force Call Yes No
Manual Answer Yes No
Day To Night Mode Yes No
Time For Day To Night Mode HH:MM

Agent Group–Setup
AgGp_01
AgGp_02
AgGp_03
AgGp_04
Agent Group Name XXXXXXXX
Agent Name XXXXXXXX
ID # XXX
Password XXX
Priority 01-04
Wrap-Up MM:SS

Line Group Setup
LnGp_01
LnGp_02
LnGp_03
LnGp_04
Line Group Name XXXXXXXX
First Message X
Second Message X
Night Message X
Special Message X
First Message Delay MM:SS
Music Interval MM:SS
Line Group Priority 01-04

Management Info
Real Time Setup
Incoming Call Parameter MM:SS
Outgoing Call Parameter MM:SS
Busy Call Parameter MM:SS
Real Time
Traffic Activity
Agent Activity
Traffic Status
Service Status
Agent Status
Historical
Current
Hourly
Report Type
Waiting Time
Abandon Call
Incoming Call
Agent Activity
Average Time
System Capacity
Report Format
Numerical
Graphical
Note
Print
Daily
Report Type
Waiting Time
Abandon Call
Incoming Call
Agent Activity
Average Time
System Capacity
Call Profile
Account Code
Report Format
Numerical
Graphical
Note
Print
Configuration
Group
Print

Appendix E

Backup Utility

What is it?

The Backup Utility allows you to make security Backup copies of the statistical data (i.e. the report files) gathered by the ACD. These copies are made to standard 3.5" high-density floppy disks.

Once these Backup copies have been made the Backup Utility can then be used to Delete the old copies of these files from the Hard Disk of the ACD.

Why should you use it?

As well as providing a measure of security for your data, using the Backup Utility will free up space for the ACD to re-use, and will prevent the ACD from slowing down due to congestion of the Hard Disk with old files.

How often should you use it?

Typically, you should use the Backup Utility at least once every three months.

How Do You Use it?

There are three simple steps.

You must tell the system which period you wish to Backup or Delete from. For example you might wish to work with last months files, or the previous quarters files, or files from any arbitrary period, such as the 15th of January to the 15th of March.

You then tell the Backup Utility which file types you wish to work with: these may be the Hourly, the Daily, the Weekly or the Monthly files, or all of them.

You then tell the Backup Utility to either perform a Backup or a Delete on those files for that period.

Using the Backup Utility

Running the Backup Utility

The Backup Utility is accessed as follows. Sign in at the ACD Call Processor as the System Manager, and then select the System Backup option from the menu bar. A menu with two options on it will appear. Select the Report Backup option.

(diagram 1 - acd system manager screen with report menu)

A dialogue box will appear with two buttons on it. If you select the one marked Cancel the dialogue box will close and nothing will happen. If you select the button marked Backup a further, smaller dialogue box will appear, with buttons marked Continue and Cancel.

(diagram 2 - acd system manager screen, with dialogues)

Selecting the Cancel button will take you back to the previous dialogue box. Contineu will close down the ACD and will start the Backup Utility Program.

Note: The ACD will cease to function whilst you are using the Backup Utility - make sure you are certain that you want to close down the ACD operation before you go to the Backup Utility, and remember to invoke the Norstar BACKUP service mode.

When the Backup Utility starts you will see the screen change to display the following.

(diagram 3 - Backup Utility welcome screen)

Press any key or click the left mouse button to remove the welcome window, and to make the menu at the top of the screen appear, as shown below.

(diagram 4 - Backup Utility main menu)

The Backup Utility Help System

The Backup Utility contains help screens that can be accessed at any time by pressing the F1 key. This will cause a help screen to appear that will either describe the operation you are currently performing, or the currently highlighted menu option.

Help screens can be closed by pressing the Escape key.

(diagram 5 - help screens)

You can also select the Help menu option from the main menu to access the Help system menu, where you will find help on the help system istelf, on how to use the menus and how to use the mouse.

Selecting and using menu options in described in the next section.

Interacting with the Backup Utility

You interact with the Backup Utility in the same manner as you do with the rest of the ACD system - you can use the keyboard or the mouse, or a mixture of both.

When you move the mouse around the mouse mat a block will move over the screen. This is the mouse cursor. To select a menu option for example, you would position the mouse cursor over the option you wish to use and then click the Left mouse button.

To use the keyoard you can move the highlight bar along the menu by pressing the Left or Right Arrow keys to highlight the option you wish to use, and then press the Enter key to activate it, or you can just press the letter which is highlighted in yellow for each option. So, to access the File Type menu option,you could just press the F key on the keyboard.
Some menu options lead to other, smaller menus, like the Help option or the Quit option.

To leave a sub-menu like these and to return to the previous menu, you can either press the Escape key, or, with the mouse cursor positioned on the menu line, press the right mouse button.

The Backup Utility Main Menu Options

Backup

Before you can use the Backup option you must first tell the Backup Utility which type of Data Files you wish to Backup and also the Start Date and End Date of the period in which you wish to carry out the Backup.

When you have done that and then selected the Backup option the system will check which files are going to need to be copied, and will tell you how many disks you are going need.

Note: The disks that you use must be 1.44 Megabyte Hi-density disks, and they must be formatted. You can either buy the disks and format them yourself if you have access to a PC, or you can buy ready formatted disks. The disks must be blank—that is, containing no previous data or files.

You will be prompted to enter each disk as they are required.

The data files are put onto the disks in sub-directories, called BACK001 on the first disk, BACK002 on the next, and so on, for as many disks as it takes. You should label and date each disk as you remove it from the disk drive.

(diagram 5 - Backup Utility showing the user how many disks they are going to need)

Delete

Before you can use the Delete option you must first tell the Backup Utility which type of Data Files you wish to delete and also the Start Date and End Date of the period you wish to delete files in.

When you have done that and then selected the Delete option the system will check which files are going to be deleted, and will tell you how much disk space you will recover by deleting them.

Note: Make sure you are CERTAIN that you wish to delete the files before you do so - once they have been removed, if you haven't already made Backups of them, they will be gone forever!

Help

This option leads to a further menu offering access to Help screens on the Help system itself, the use of the Backup Utility menus and the use of the mouse.

Set File

Before you can use the Backup or Delete options, you must first tell the Backup Utility which type of Data Files you wish to work with, and also the Start Date and End Date of the period in which you wish to carry out the Backup or Delete operation.

If you select this option, you will be presented with a "popup menu". On the menu will be the file types you can choose from. There is also an option labeled `All Data Files` which will cause the Backup or Delete operation to work with all files of all types, and there is an option labeled `All (Not Hourly)`.

Note: Many users wish to set a Start date and an End Date and to then Backup all of the files from that period apart from the hourly ones, but wish to Delete all of the files in that period once the Backup is completed. The All data Files and the All (Not Hourly) options allow you to do this easily.

To select an option from the popup menu, you can either highlight the option using the **Home**, **End** and **Up** and **Down** Arrow keys and then press **Enter**, or you can use the hotkey method. The hotkey method allows you to choose an option by pressing the keyboard character which corresponds to the highlighted (yellow) letter in the option of your choice. The **Esc** key will close the popup menu without making a new selection.

Once you have selected a file type, it will be displayed on the bottom border of the main window.

The File Type that you pick dictates which files are operated on by the next Backup or Delete operation.

Once a File Type has been selected, it will stay set until you change it again. This means you can set the Start and End Dates, set the File Type and then do a Backup and then do a Delete with the same settings.

If you pick All Files, data files of all type (Hourly, Daily, Weekly and Monthly) are operated on at once, if you pick All (Not Hourly) the files types operated on will be the Daily, the Weekly and the Monthly files only.

Note: If Weekly or Monthly files are going to be included in the Backup or Delete operation, the Start Date must be the 1st of a month and the End Date must be the last day in a month (but the Start Date and End Date do not need to be in the same month, so 1/09/1994 and 31/10/1994 is a valid period).

This applies to the All Files setting too, as the All Files setting includes the Weekly and Monthly data files automatically.

Set Start

Before you can use the Backup or Delete options, you must first tell the Backup Utility which type of Data Files you wish to work with, and also the Start Date and End Date of the period in which you wish to carry out the Backup or Delete operation.

You enter the Start Date for the work period in the format DD/MM/YYYY, so that February 1st 1994 would be entered as 01/02/1994.

Dates are checked as they are entered to make sure that you haven't asked for the 32nd of a month, or a date next year and so forth.

Once you have set the Start Date and the End Date you can use them repeatedly. They stay set until you change them.

This means you can set the two dates and say, Backup the Hourly Files, then do a Delete on the Hourly Files in the same period, then do a Backup on the Daily Files and then Delete those too, all with one setting for the Start and End Dates.

Note: You can't enter a date in the current month, only full elapsed months can be worked on. Also, if you want to work with Weekly, Monthly or All Files the Start Date MUST be the first day in a month.

Set End

Before you can use the Backup or Delete options, you must first tell the Backup Utility which type of Data Files you wish to work with, and also the Start Date and End Date of the period in which you wish to carry out the Backup or Delete operation.

You enter the End date for the work period in the format DD/MM/YYYY, so that February 1st 1994 would be entered as 01/02/1994.

Dates are checked as they are entered to make sure that you haven't asked for the 32nd of a month, or a date next year and so forth.

Once you have set the Start Date and the End Date you can use them repeatedly. They stay set until you change them.

This means you can set the two dates and say, Backup the Hourly Files, then do a Delete on the Hourly Files in the same period, then do a Backup on the Daily Files and then Delete those too, all with one setting for the Start and End Dates.

Note: You can't enter a date in the current month, only full elapsed months can be worked on. Also, if you want to work with Weekly, Monthly or All Files the Start Date MUST be the first day in a month.

Set Path

You will not need to use this option, it is intended for future expansion and is not required in this release of the Backup Utility.

Info

This option provides a window which shows the Start and End Dates (if they have been set) spelled out with the names of the day and the month so that you can see exactly which two dates you have entered.

It also shows how many days there were between the two dates, so you can see how many days worth of data would be affected by a Backup or Delete action.

Quit

The Quit option from the main menu causes a sub-menu with two options on it to appear. These two options are `Remain` and `Quit`.

`Remain` will keep you in the Backup Utility (in case you have selected Quit from the main menu in error), and the `Quit` option will leave the Backup Utility, and the ACD system will re-start.

Note: Remember to put the Norstar back into the Normal service mode once the ACD system has reset itself, and if it is during your normal working hours, instruct your Agents to log back in.

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Installing The Total Control PC Attendant Position On The DXP Digital Communications System

1.0 Introducing The Total Control PC Attendant Position

The Total Control PC attendant position is a computerized attendant operating station for the DXP digital communications system. It consists of an IBM-compatible personal computer, a proprietary interface circuit board (factory-installed in the computer expansion slot), a customized keyboard, a program diskette, and all necessary cables for connecting the equipment to the DXP.

The DXP system will support a maximum of two Total Control PC attendant positions. Each PC attendant position requires the following DXP interface ports:

- one station port (no wiring connections required),
- two loop-start line ports that it uses for a 4-wire audio connection with the DXP,
- one serial data port that it uses for data communications with the DXP.

NOTE: The DXP provides two RS-232 serial data ports on the CPU board. You can use either of these ports for PC attendant position connection or you can install a DXOPT–COM communications card in the DXP system to provide a serial data port for PC attendant position use. Install the card using the procedures that you can find in your System Hardware Instructions' installation section.

Each Total Control PC attendant position uses the system logic associated with one station port for communications to the DXP system; therefore, the PC attendant position replaces one telephone from the system since you cannot connect a telephone to the station location that the Total Control PC attendant position is using.

1.1 Default Locations

The system default locations for the PC attendant positions are as detailed below; however, you can reassign the locations through programming.

- For PC attendant position 1,

station location = station location 1 (Intercom 101)
line ports = lines 1 and 2
serial data port = port 1
line group = 1

- For PC Attendant position 2,

station location = station location 2 (Intercom 102)
line ports = lines 3 and 4
serial port = port 2
line group = 1

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The information contained herein does not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.
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1.2 Checking The Contents Of Your Equipment

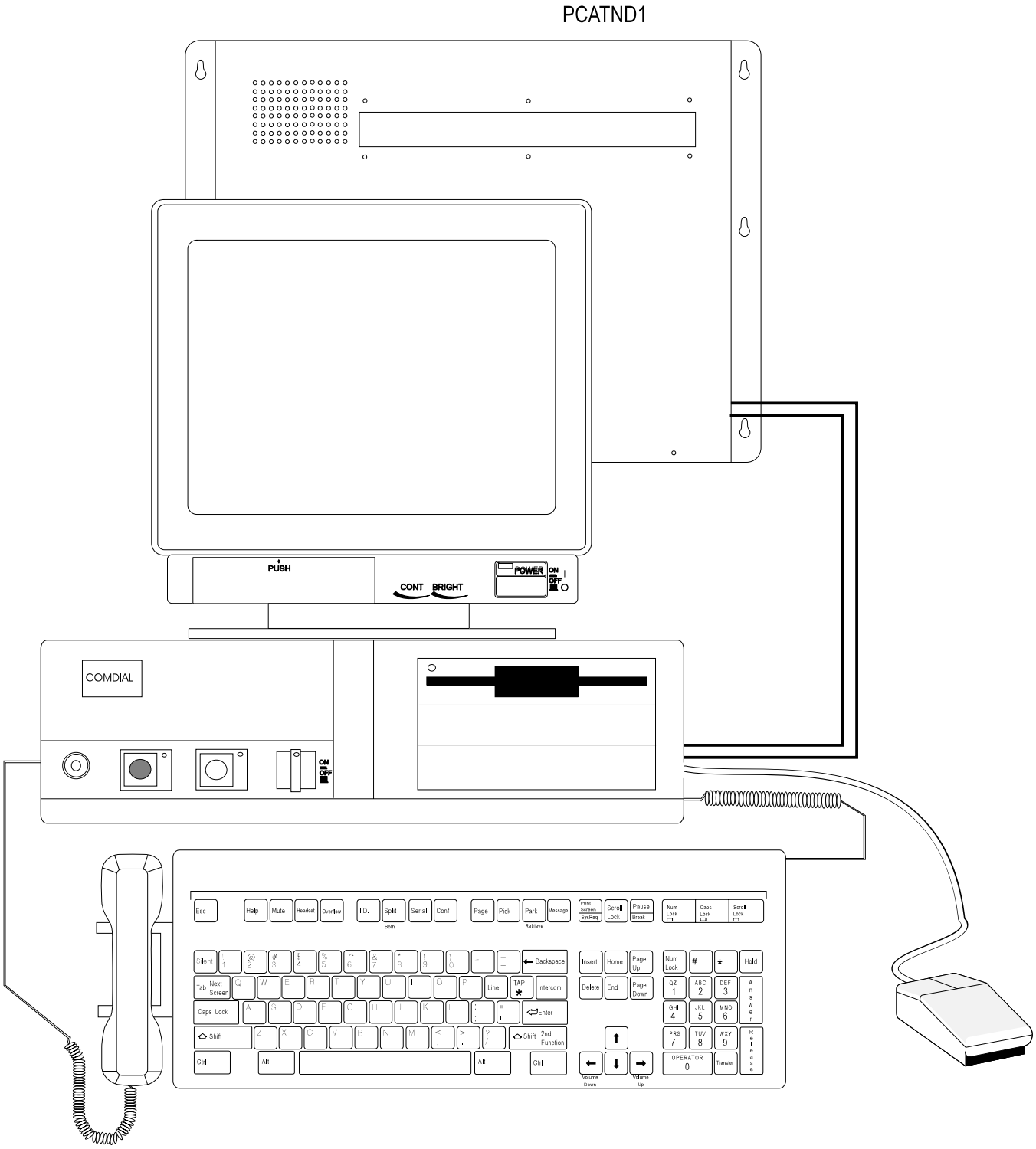
Before you begin any installation, you should check to make sure that all of you equipment is in order. Check for all of the following items:

- 80386 or faster, IBM-compatible Personal Computer (with proprietary interface installed) equipped with an MS-DOS version 3.3 or later or compatible operating system,
- Floppy Disks and Operating Manual for MS-DOS version 3.3 or later
- *Total Control* System Operating Disk,
- video display monitor
- customized keyboard (with handset cradle),
- telephone handset,
- handset coil cord,
- 4–conductor modular line cord,
- modular-to-EIA adapter,
- 6–conductor modular line cord with installed ferrite collar.

1.3 Finding Related Publications

The following is a list of publications that you may find helpful in your installation of the PC Attendant.

- IMI66–001, *Installing The DXP Main Common Equipment Cabinet*
- Instruction manual for supplied personal computer
- GCA70–230, *Total Control PC Attendant's Console User's Guide*



Viewing The Total Control PC Attendant Position

2.0 Installing The System Wiring

Install and connect the personal computer, the video monitor, and the keyboard per the instructions provided in the manual supplied with that equipment. Install the DXP system using information provided in its installation instructions that you can find in the system hardware instructions binder. Interconnect the equipment for PC attendant operation using the information supplied in the following paragraphs.

2.1 Making The Data Connections

If you use the RS232 1 serial data port, its data parameters default to match the PC attendant position; however, with current release DXP software and current release PC attendant position software, you must program the flow control parameter of data port to be CTS/RTS. If you use any serial data port other than RS232 1, you must program that port's data parameters to be 9600 baud, 8 data bits, 1 stop bit, and CTS/RTS flow control.

When operating the port at 9600 baud, the maximum distance from a serial data port that you can confidently locate a PC attendant position is 500 feet.

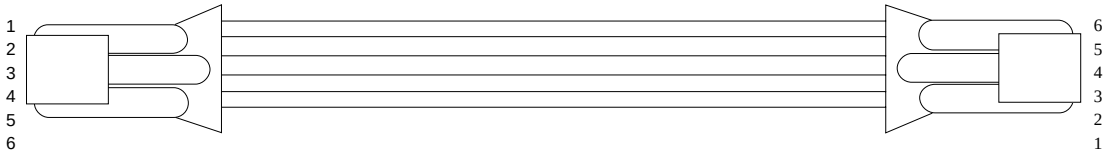
When making the necessary wiring connections take note of the following percautions:

- in a noisy electrical environment, use shielded cable for the data communications,
- keep the data communications wiring separate and as far away as possible from the voice-pair wiring
- as an added precaution against induced interference, route the data cable as far away from any fluorescent lighting as you can reach,
- make every effort to route the data cable perpendicular to other wiring.

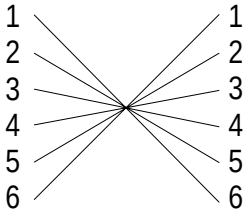
Typically, make the direct-wired data connections using customer-supplied modular jacks (type 625A2-6), the equipment-supplied 6–conductor modular line cord, and a customer-provided standard 6–conductor line cord. Make the wiring connections by following this procedure.

1. Install the industry-standard modular jacks at the DXP location (Data Jack A) and at the PC attendant position location (Data Jack B). Route the wiring between these jacks using twisted-pair wire.

NOTE: The wiring from the DXP Plus serial data port to the modular-to-EIA adapter that is connected to the PC attendant position must be mirrored just as they are in a standard 6–conductor line cord. This means that if you use modular jacks and house wiring to make the data connection, you MUST maintain the signal polarity reversal, or roll-over, found in a standard 6–conductor line cord.



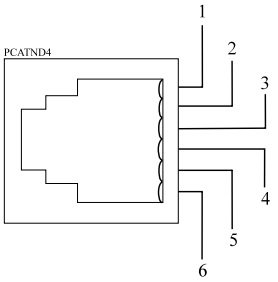
PCATND2



Detailing A Standard 6–Conductor Line Cord

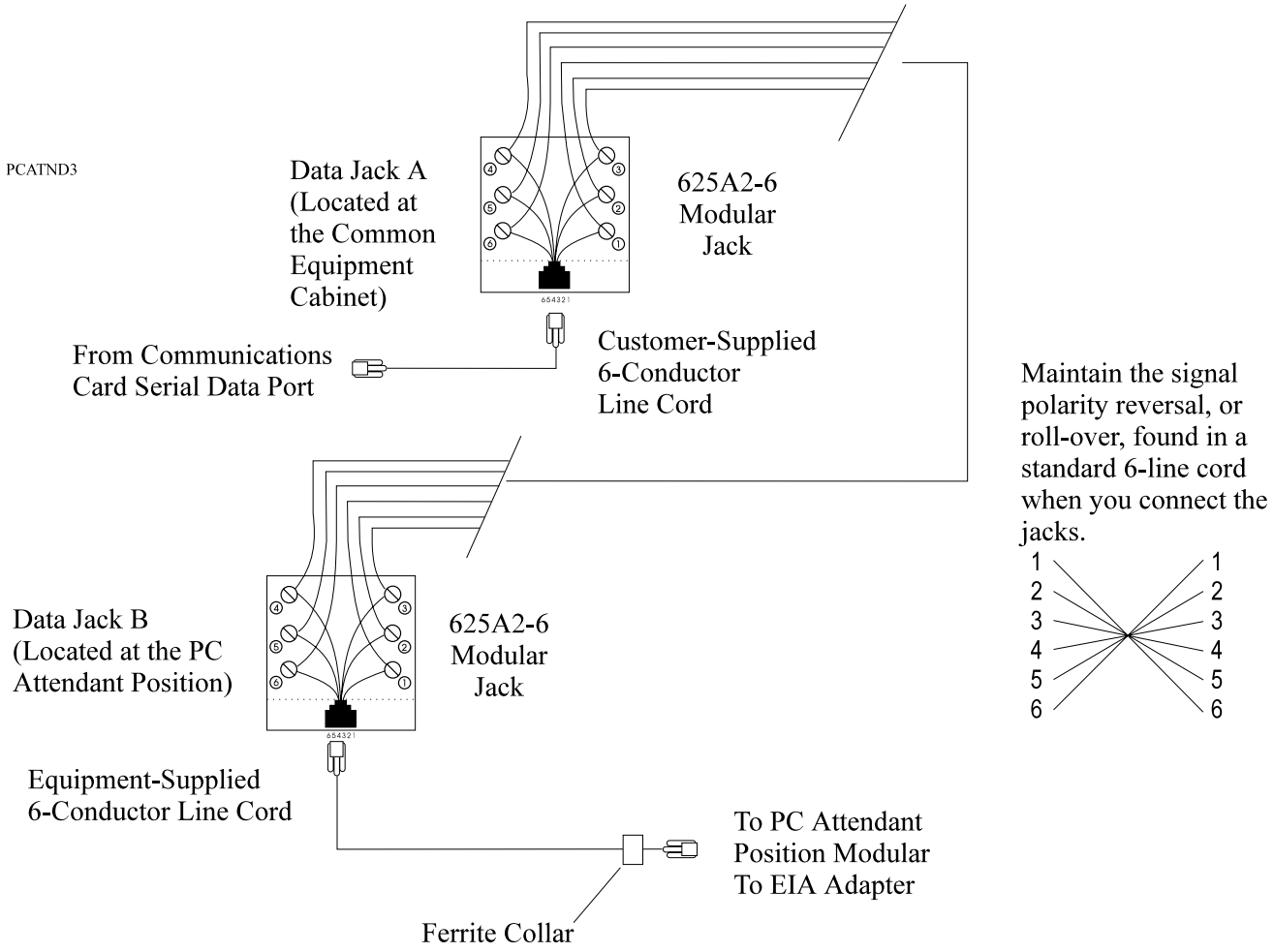
2. Connect a customer-supplied, 6–conductor line cord between the serial data port on the DXP and the modular jack that you located near the DXP (Data Jack A).

Typical Serial Data Port



Pin 1 = (RTS) Request to Send
Pin 2 = (CTS) Clear to Send
Pin 3 = (RD) Receive Data
Pin 4 = (TD) Transmit Data
Pin 5 = (SG) Signal Ground
Pin 6 = (GND) Chasis Ground

Detailing The Serial Data Port Connection



Making The Data Connections

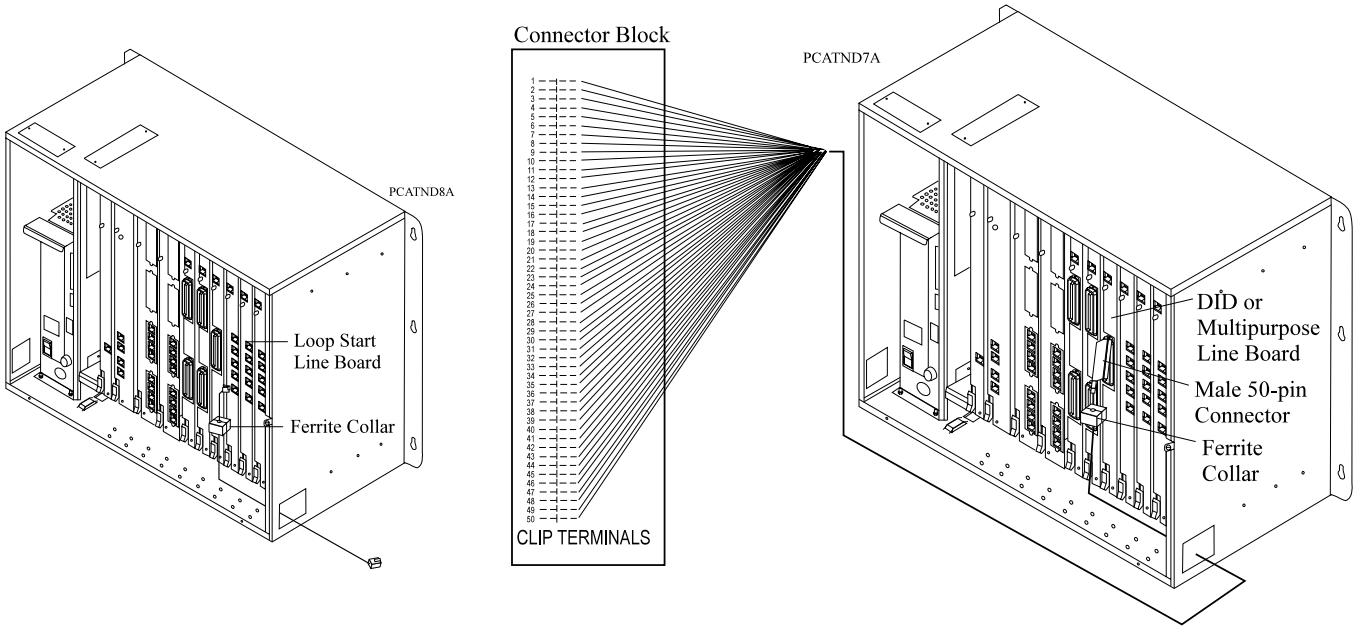
2.3 Making The Line Connections

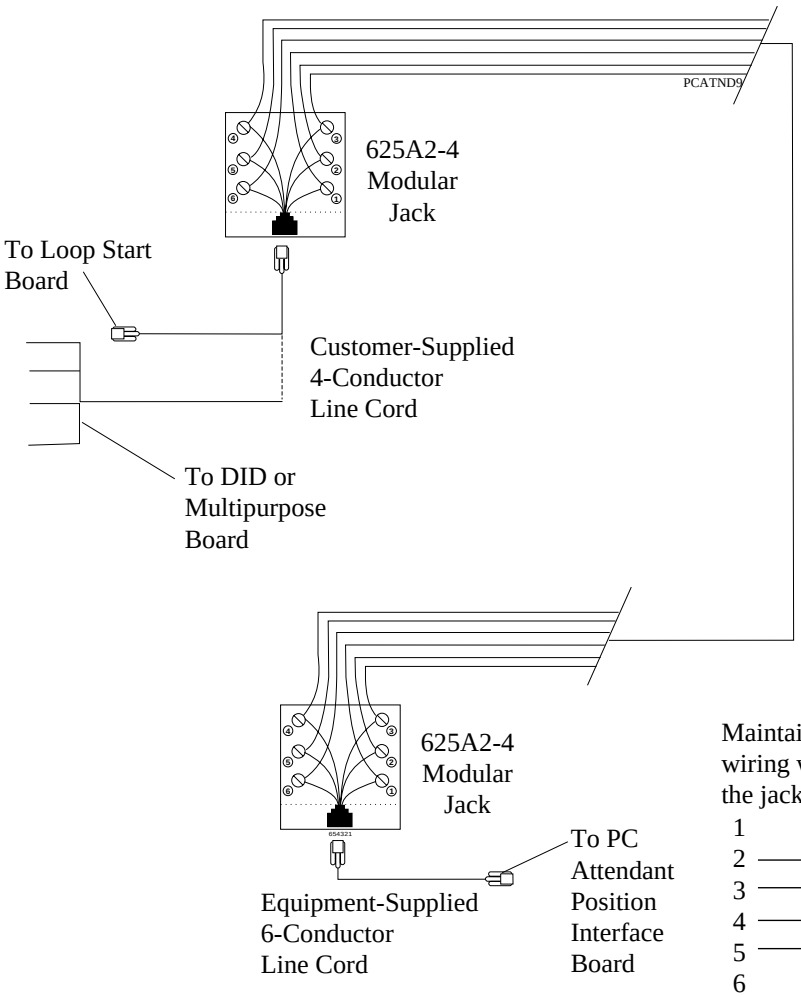
When you are connecting to a loop start line board, make the line connections using customer-supplied modular jacks (type 625A2-6), a customer-provided standard 4–conductor line cord and an equipment-provided 4–conductor line cord.

1. Install the industry-standard modular jacks at the DXP location (Line Jack A) and at the PC attendant position location (Line Jack B).
2. Wire the jacks **straight-through** (that is; wire T1 to T1, T2 to T2, R1 to R1, and R2 to R2) using twisted-pair house wiring.

When you are connecting to a DID or Multipurpose line board, note that these boards provide line connections through a 50-pin connector instead of an industry-standard modular jack. Make line connections to these boards using a customer-supplied 50-pin connector block (66-type), a standard 25-pair cable, a customer-supplied modular jack (type 625A2-6), and an equipment-provided 4–conductor line cord.

1. Install the 66-type 50-pin connector block at the DXP location.
2. Install the industry-standard modular jack at the PC attendant position location (Line Jack B).
3. Use twisted-pair house wiring to connect the desired line pairs from the 50-pin connector block to the customer-supplied modular jack at the PC attendant position location (Line Jack B).





Maintain straight-through wiring when you connect the jacks.

1	1	No Connction
2 ——	2	Ring 2
3 ——	3	Tip 1
4 ——	4	Ring 1
5 ——	5	Tip 2
6	6	No Connection

Making The Line Connections

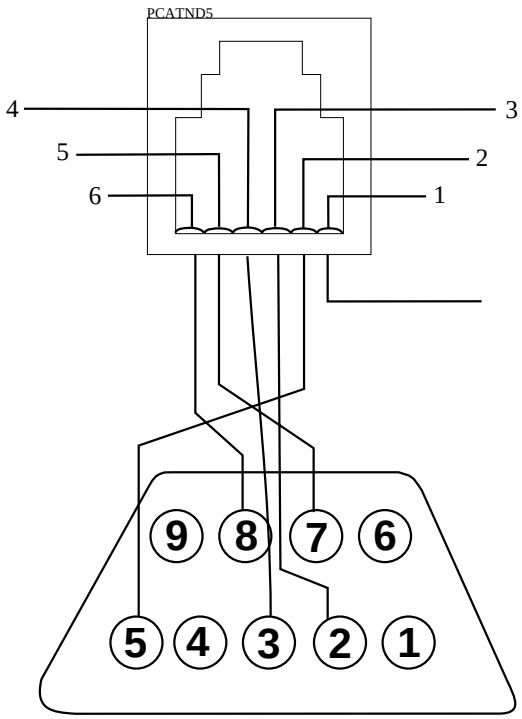
2.4 Making The PC Attendant Position Connections

1. Connect the supplied modular-to-EIA adapter to the COM1 serial data connector on the PC attendant position personal computer.
2. Connect the supplied 6–conductor (with ferrite collar) line cord between the modular-to-EIA adapter and the modular jack that is wired to the DXP serial data port. Keep the ferrite collar near the PC attendant position.
3. Connect the supplied 4–conductor line cord between the LINE jack on the proprietary interface board and the modular jack that is wired to the DXP line board.
4. Connect the handset coil-cord to the HANDSET jack on the proprietary interface board. Note that the interface also provides a HEADSET jack if the user requires headset operation.
5. Disconnect the telephone that the PC attendant position replaces. ***Record its station number*** for use when programming the system to accept the PC attendant position.

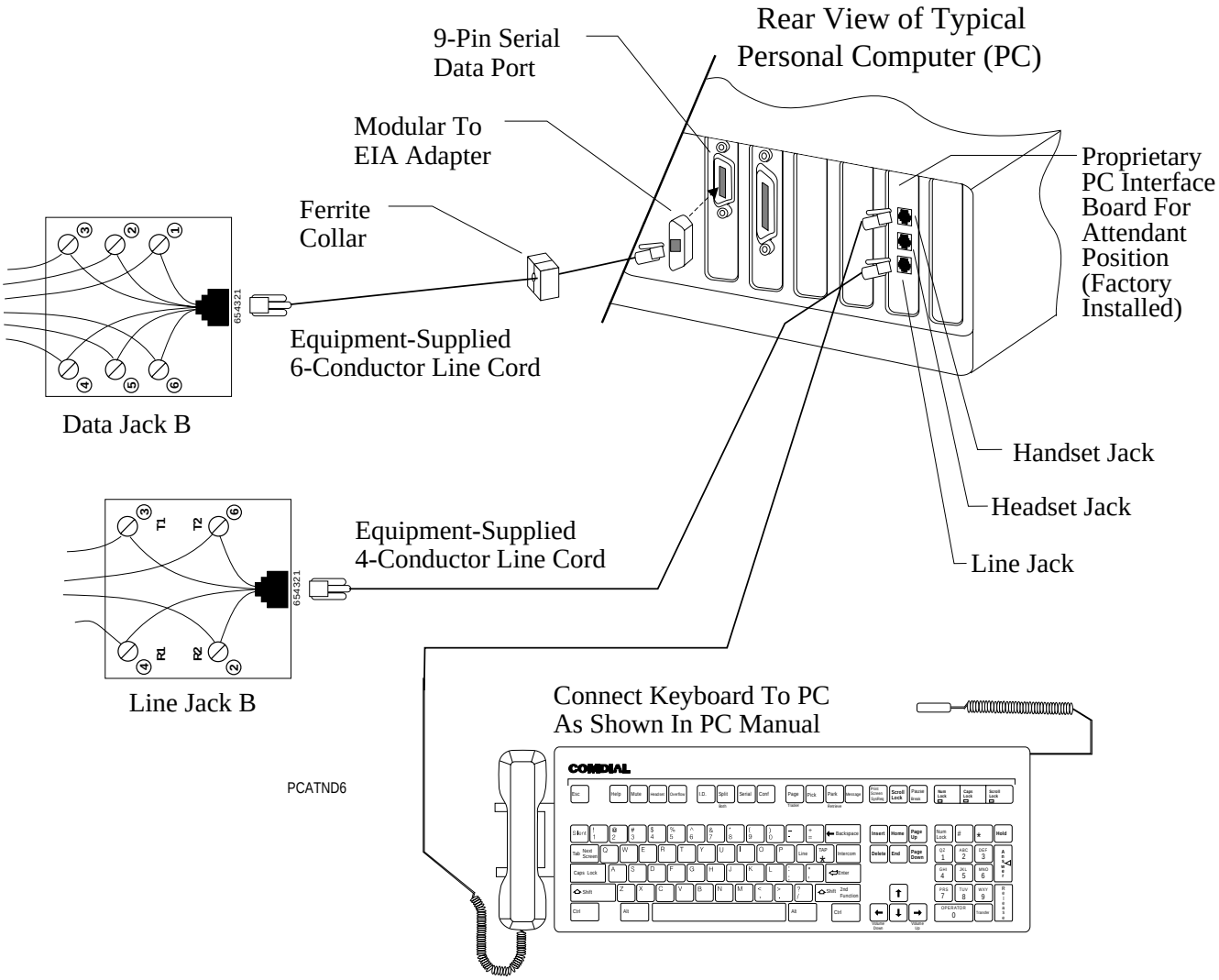
Modular Jack
Pin 1 = No Connection
Pin 2 = (SG) Signal Ground
Pin 3 = (TD) Transmit Data
Pin 4 = (RD) Receive Data
Pin 5 = (CTS) Clear to Send
Pin 6 = (RTS) Request to Send

DB9 Connector
Pin 1 = No Connection
Pin 2 = (RD) Receive Data
Pin 3 = (TD) Transmit Data
Pin 4 = No Connection
Pin 5 = (SG) Signal Ground
Pin 6 = No Connection
Pin 7 = (RTS) Request to Send

Pin 8 = (CTS) Clear to Send
Pin 9 = No Connection



Detailing The Modular–To–EIA adapter



Locating The PC Attendant Position Connections

3.0 Testing The PC Attendant Position Installation

1. Use the DXP programming procedures, and program the system to accept PC attendant operation. Remember, each PC attendant position requires a station port, two line ports, a serial data port, and a line group for operation. You must identify these items through this programming action for each PC attendant position before the equipment will function properly.
2. Factory technicians loaded the PC attendant position software on the personal computer's hard drive as an executable file before shipping the equipment. The technicians also configured the computer's autoexec.bat file to automatically load the PC attendant software when you turn on the computer. When you turn on the computer, it should execute its *boot-up* procedure and then show the PC attendant position menu screen.
3. Use the information detailed in GCA70-230, *Total Control PC Attendant's Console User's Guide* to test the PC attendant position's operation.
4. If your system does operate properly, check your wiring for proper connections and verify that you set the proper programming parameters.

4.0 Radio Frequency Interference

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Subpart J of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient the television or radio's receiving antenna, and/or relocate the equipment, and the radio or TV with respect to each other. If necessary, the user should consult the manufacturer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the Government Printing Office, Washington D.C. 20402. Stock No. 004-000-00345-4.

This digital apparatus does not exceed the (Class A) limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

5.0 Programming For The PC Attendant Position

Use the following procedures to program the DXP to operate with the PC attendant position. Follow these procedures in the order that this manual presents them as they provide a logical progression of the programming.

5.1 Enabling The PC Attendant Position

Description: Each PC attendant position requires a station port, two line ports, a serial data port, and a line group for operation. You must identify these items through this programming action for each PC attendant position before the equipment will function properly.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select PC attendant and press ENTER.
4. Type PC attendant number (1–4) and press ENTER.
5. Type item number for station port and press ENTER, then type 1–480 for station port .
   Important—disconnect any telephone that is currently installed there.
6. For line pair, type odd/even number pair that corresponds to location where cable was connected on common equipment (for example, enter 1,2 or 15,16 or 119,120 and so forth).
   Special instruction—Always type the odd line number first. Remember, the line numbers on each line board ascend from bottom line jack (lines 1,2) to top line jack (lines 7,8), and the line ports on the main and expansion cabinets ascend from right to left based on the board slot (line ports 1–8, 9–17, 18–26 and so forth).

NOTE: The lines that you assign here are exclusively for PC attendant position use and cannot be used for out-going call operations. Do not assign them for any other system use.

7. For line group, type line group number (1–16).
8. For serial port, type 1 or 2 for RS-232 port 1 or 2 on the system central processor board where you connected the PC attendant position.
9. Press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Press ESCAPE twice to end.

5.2 Programming A Hunt List For PC Attendant Use

Description: Assign eight intercom numbers to an intercom hunt list for the PC attendant position's use. The assigned numbers must include the personal intercom number of the PC attendant position (the number for the station location that the PC attendant position occupies) and seven group intercom numbers that are set aside for its exclusive use (group intercom numbers range from 3101–3292, 4110–4292, 5000–5023) . When you assign group intercom numbers to the hunt list, the system automatically adds them to the group intercom access list for the PC attendant position.

NOTE: Do not assign the same group intercom to more than one station's intercom hunt list.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number of PC attendant position or previously assigned name and press ENTER.
5. From station programming menu, type item number for intercom hunt list and press ENTER.
6. Type personal intercom number for PC attendant position first then type seven group intercom numbers and press ENTER.
   Separate each entry with a comma (nnn,nnn,nnn,nnn)

   NOTE: Reserve these group intercom numbers for exclusive use by the PC attendant position. Do not assign them to any other station.

7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

5.3 Assigning Lines For PC Attendant Use

Description: Choose several lines that the PC attendant position can use for call origination; assign them to line group 16; assign line group 16 to a particular class of service; and assign that particular class of service to the PC attendant position. The line key on the keyboard is fixed to select line group 16. You must assign lines to line group 16 before the attendant can select a line for use.

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line group programming and press ENTER.
4. Type 16 and press ENTER.
5. Type a to add lines and press ENTER.
6. Type lines to be added and press ENTER.
7. Press ESCAPE once.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to return to main menu.
10. From main menu, select stations and press ENTER.
11. From stations menu, select station COS programming menu and press ENTER.
12. Type class of service number (1–32) and press ENTER.
13. From the COS programming menu, type item number for line group access and press ENTER. Remember—use CONTROL N to find the correct screen.
14. Type 16 and press ENTER.
15. When finished, Press ESCAPE twice.
16. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
17. Press ESCAPE to return to main menu.
18. From main menu, select stations and press ENTER.
19. From stations menu, select station programming menu and press ENTER.
20. Type personal intercom number of PC attendant position or previously assigned name and press ENTER.
21. Type number for class of service and press ENTER.
22. Type class of service number that has line group 16 assigned and press ENTER.
23. When finished, press ESCAPE twice.
24. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
25. Press ESCAPE to end.

5.4 Assigning The PC Attendant Position Text Messaging Buttons

Description: Use this programming procedure to assign special text messaging functions to system telephone buttons. User's can press these buttons to access the text messaging feature provided by the PC attendant position. Program the telephone to provide the following button functions:

Text Message button for the user to press to step forward through the fields of a message that shows in the telephone's display window,

Print button for the user to press to send the displayed message to an attendant selected data printer for hard copy printout,

Next button for the user to press to sequence through a group of stored messages,

Previous button for the user to press to back-up through the fields of a message that he or she has already read,

Delete button for the user to press to erase a message after he or she has read it or sent it to the data printer,

Quit button for the user to press to end a text messaging session.

Programming:

1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select button mapping and press ENTER.
4. Type prime intercom number or previously assigned name and press ENTER. The VDT presents a button map of the current button functions for the requested station shown for your review.
5. Type code (L1–L25) for button that you wish to program.
6. Type one of the following mnemonics and press ENTER.
   OAI59 = Delete button
   OAI60 = Print button
   OAI61 = Previous field button
   OAI62 = Next message button
   OAI63 = Quit button
   OAI64 = Text message/next field button
7. Repeat steps 5 and 6 until you have assigned all test messaging buttons and press ENTER.
8. Press ESCAPE and repeat steps 4 through 7 for each station.
9. When finished, press ESCAPE twice.

5.5 Mapping PC Attendant Position Function Keys

Description: The DXP adds programmable function keys to the PC Attendant Position. The programmable features are in addition to the fixed features currently provided by function keys F1 through F12. You can assign a different feature to each function key.

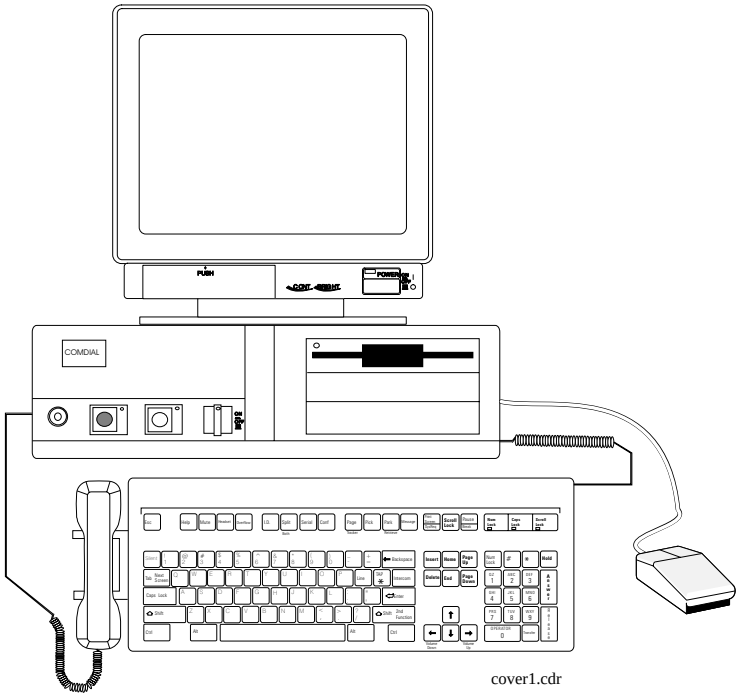
Programming:
1. Press CONTROL T for main menu,
2. From main menu, select stations and press ENTER,
3. From stations, select PC attendant and press ENTER,
4. Type attendant number (1–4) and press ENTER,
5. From PC attendant menu, select button mapping and press ENTER,
6. Press CONTROL E for button map of function keys and press ENTER,
7. Type button number (L1–L12) and press ENTER,
8. Type mnemonic (type ? for a description of mnemonic if you need it) for desired feature and press ENTER,
9. Repeat steps 7 and 8 until all feature button are programmed,
10. When finished, press ESCAPE twice,
11. Type y to accept changes, n to reject them, or r to resume editing and press ENTER,
12. Press ESCAPE to end.

Operation: To access the programmed functions on the PC Attendant Position, the user must press and hold the CTRL button while pressing the desired function button on the keyboard.

5.5.1 Listing The Function Key Mnemonics

ACCT (account code button): allows users to enter an account code
ALTRN (alternate attendant button): places station in alternate attendant mode
ANSWER (answer button): answers a ringing call
APAGE (auxiliary page button): allows auxiliary page operation (model 8024S and 7700S–rev I and later)
ARD (automatic redial button): redials last dialed number 10 times with one minute off time
ARECD (auxiliary record button): allows auxiliary record operation (model 8024S and 7700S–rev I and later)
ARING (auxiliary ring button): allows auxiliary ring operation (model 8024S and 7700S–rev I and later)
AUTH (authorization code button): prompts for authorization code entry
BOTH (both button): conferences current party with last party placed on hold
CAMP (camp on button): engages camp on feature at busy station or line
CID (caller ID button): sends caller ID RNA records to LCD
DND (do not disturb button): enables/disables do not disturb mode
DPKUP (directed call pick up button): picks up call ringing at another station
DSTAT (DSS status button): selects station DSS status view (line and intercom or just intercom)
EXOVR (executive override button): allows executive override of another station
FEATR (feature button): use with feature code to access certain features
FWD-A (forward all button): enable/disable all call forwarding
FWD-P (forward personal button): enable/disable prime line and personal intercom call forwarding
FWDRA (forward all RNA button): enable/disable all call after RNA forwarding
FWDRP (forward personal RNA button): enable/disable prime line and personal intercom calls after RNA forwarding
GPLSN (group listen button): allows group listen operation (digital multiline telephones)
GPKUP (group pick up button): picks up a call that rings anywhere within a group of stations
HDST (headset button): enables/disables headset mode
HOLD (hold button): places current call on hold and scrolls list of held calls
ITCM (intercom button): accesses personal intercom number
I#### (intercom number button): group intercom number or station DSS
LCDMS (LCD messaging button): enables/disables LCD message feature
LNG## (line group button 1–16): accesses one of 16 line groups
LN### (line button 1–240): accesses one of 240 lines
LOCK (lock button): prevents/allows station use (prevents station use until someone dials an authorization code)
MMEPG (meet me page button): answers a page by meeting intercom paging party on line
MSGWT (message waitng button): turns on/turns off message waiting light at another station
MUSC# (music source button 1, 2): turns on/turns off background music
NIGHT (night mode button): allows attendant to place system in night transfer (of ringing) mode
OAI## (open architecture button): special Enterprise functions (used with *Total Control* PC Attendant and Enterprise Toolkit options)
OVERFL (overflow button): turns on/turns off overflow mode
PAGE# (paging zone button 1–8): allows group paging
PARK# (park orbit button 1–9): parks and retrieves calls
PRVCY (privacy button): releases privacy on line so another station can join a call
QUEUE (queue button): queues station at busy line group to await idle line
RLSE (release button): disconnects current call
RSP## (response button 1–30, ✳ = universal): sends response message to another station for SOHVA and message deposit
S-OBS (service observe button): enables station to service observe another station
SAVE (dynamic save button): saves last dialed number and line on which it was dialed
SDIAL (speed dial): saves often dialed number at a button
SILNT (silent ringer button): mutes ringing for current call
SOHVA (SOHVA button): sends SOHVA to another station
SPLIT (split button): allows station user to talk to two different parties
SRIAL (serial call button): transfers a serial call to specified stations
SYSST (system status report button): indicates system status report
TAFS# (night answer button 1–4, ✳= all calls): answers call indicated by system's ringing relay
TBUSY (line test busy button): views status of busy line
TRACK (tracker pager activate button): sends message to pager display
VABLK (voice announce block button): blocks/allows voice announcements
VOLSV (save volume button): saves volume settings (digital multiline telephones)
XVM## (transfer to voice mail button 1–32): transfers call to voice mail box when used with DSS button

COMDIAL



cover1.cdr

Total Control
PC Attendant's Console
User's Guide
For The DXP and DXP *Plus*
Digital Communications System



Comdial's Quality Management System Is Certified To The ISO 9001 Standard.

Attention

Comdial makes every effort to design the features in our communications systems to be fully interactive. Under certain conditions, some features may be incompatible with each other and will not work simultaneously. Comdial assumes no responsibility for problems caused by incompatible features.

The possible combinations of accessories and features are far too numerous for us to document in this manual. Furthermore, Comdial Corporation cannot guarantee that features will operate as described in this publication when they are combined with other features.

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1 Introducing PC Attendant

1.1 Using This Guide

To help you use your *Total Control* PC Attendant console to its fullest capabilities, we have written a comprehensive user's guide to tell you how the PC Attendant handles calls and how to use the system's many features effectively.

Chapter One, ***Introducing PC Attendant***, helps you become familiar with the system's basic features and start-up requirements.

Chapters Two and Three are designed to introduce you to the PC Attendant's call-handling features and programming options. Chapter Two, ***Handling Calls***, deals with the general use of the PC Attendant—making calls, setting the parameters. Chapter Three, ***Using The Specialized Features***, focuses on the specific features of the PC Attendant—Message, or Split, for example.

We have explained and, when needed, cross–referenced every feature—from answering an incoming call to programming system speed-dials. We suggest, however, that you become familiar with the basics of answering, directing, and making calls before you begin setting system parameters or using the system's more powerful call-handling features.

For your convenience, we have included the following:

- a troubleshooting guide,
- a glossary of general telephone and operating system terms,
- an index.

1.2 Getting Started

The Total Control PC Attendant comprises a state-of-the-art software program installed on a personal computer (PC). This combination provides total control of the operations used to visually supervise and manage your DXP Communications System. The software allows you to administer all functions of the DXP system from one-stroke key features and from a series of pull-down menus containing easy-to-understand features.

1.2.1 Software

Your PC Attendant console has the software pre-installed on the hard drive. When you start your computer, PC Attendant is automatically loaded by the autoexec.bat file. If you exit to DOS and want to restart PC Attendant, there are three things you may do:

1. type **PCATTN** at the DOS prompt,
2. simultaneously press the CTRL, ALT, and DELETE buttons to reboot the system,
3. press the reset button to reboot the system.

The default number of lines displayed on the PC Attendant screen is 25. You may change the display from 25 lines to either 43 or 50 lines. To change the number of lines displayed, type *pcattn -43* or *pcattn -50* at the DOS prompt.

NOTE: When the PC Attendant functions are transferred to an alternate attendant for an extended period of time or for the night transfer mode, it is a good idea to turn off the screen with the on/off monitor switch to prolong the life of your monitor.

If you are going to be away from the console intermittently, you can activate the PC Attendant's screen saver to prevent screen image "burn." (See "PC Settings" in chapter 3, Using The Specialized Features***.) DO NOT turn off the computer; doing so will disable all PC Attendant functions and require you to reboot the PC Attendant console.***

1.2.2 Moving The Cursor With The Arrow Keys

Your PC Attendant console is equipped with four arrow keys (up, down, right, and left), located between the main letter keys and the number keypad. Use these arrow keys to move the cursor around within a window or across the pull-down menu bar (activated by pressing the Escape key) and within the pull-down menus in order to highlight selections or features to be activated.

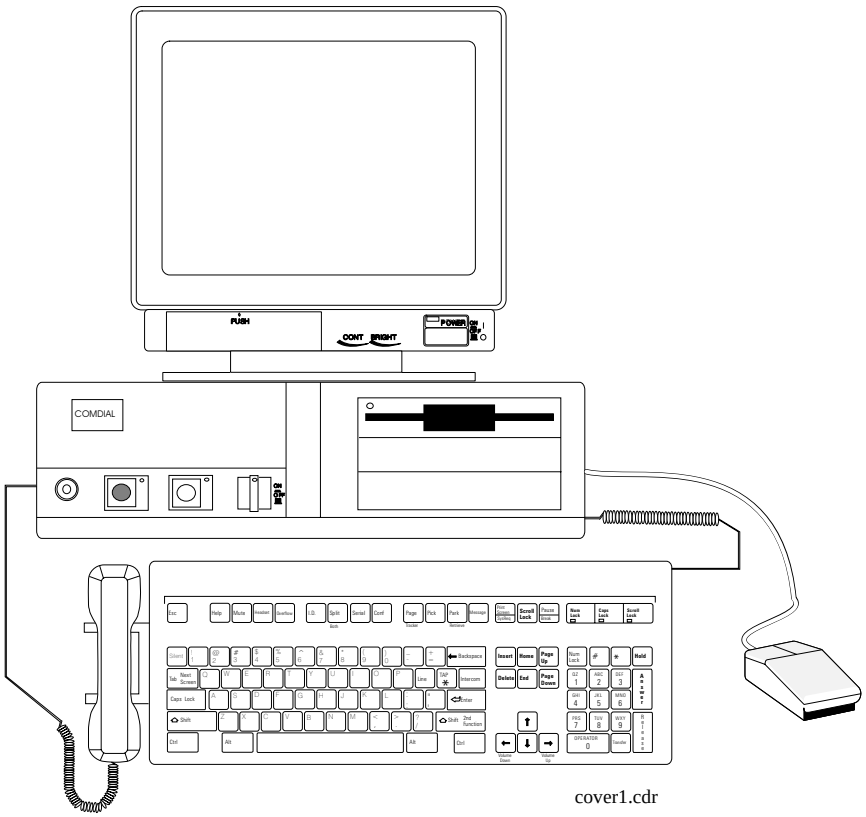
1.2.3 Moving The Cursor With The Mouse

Your equipment may accommodate a mouse (not supplied), which you can use to position the cursor to highlight or select a feature. When using the mouse to make screen selections, simply position the mouse cursor (a colored or contrasting block that highlights a number, word, or feature on the screen) to the desired selection and “click” the left mouse button to activate the selection.

Use the mouse to activate any of the pull-down menus from the menu bar appearing at the top of the main screen Intercom window: simply position the cursor on the title of the menu you’d like to access and click the left mouse button. Additionally, you can click outside any of the pull-down menus or pop-up windows to return to the main screen.

You may also use the mouse to initiate intercom calls quickly. In the Intercom window, a double click on an intercom number will cause you to dial that station (also known as a direct station select [DSS] call).

Functionally, the right mouse button is identical to the **Release** key, so you may use the button to disconnect a current call from the PC Attendant station or to complete a function such as a transfer or unattended conference (described in Chapter Two).



Total Control PC Attendant

1.3 On-line Help

The PC Attendant provides you with help whenever you need it. When you invoke the Help command, the information the system provides is pertinent to the function with which you are currently working or the window in which the cursor is positioned.

- *To Access A Help Screen,*

  1. press the **Help** button on your keyboard. After a short pause, a screen containing information about a particular function will appear. Highlighted words or phrases represent cross-referenced features related to the feature for which you originally requested help. To display the Help screen associated with a highlighted feature on a current Help screen,
  2. use the arrow buttons or the mouse to move the cursor to select that highlighted word or phrase, press **Enter**.

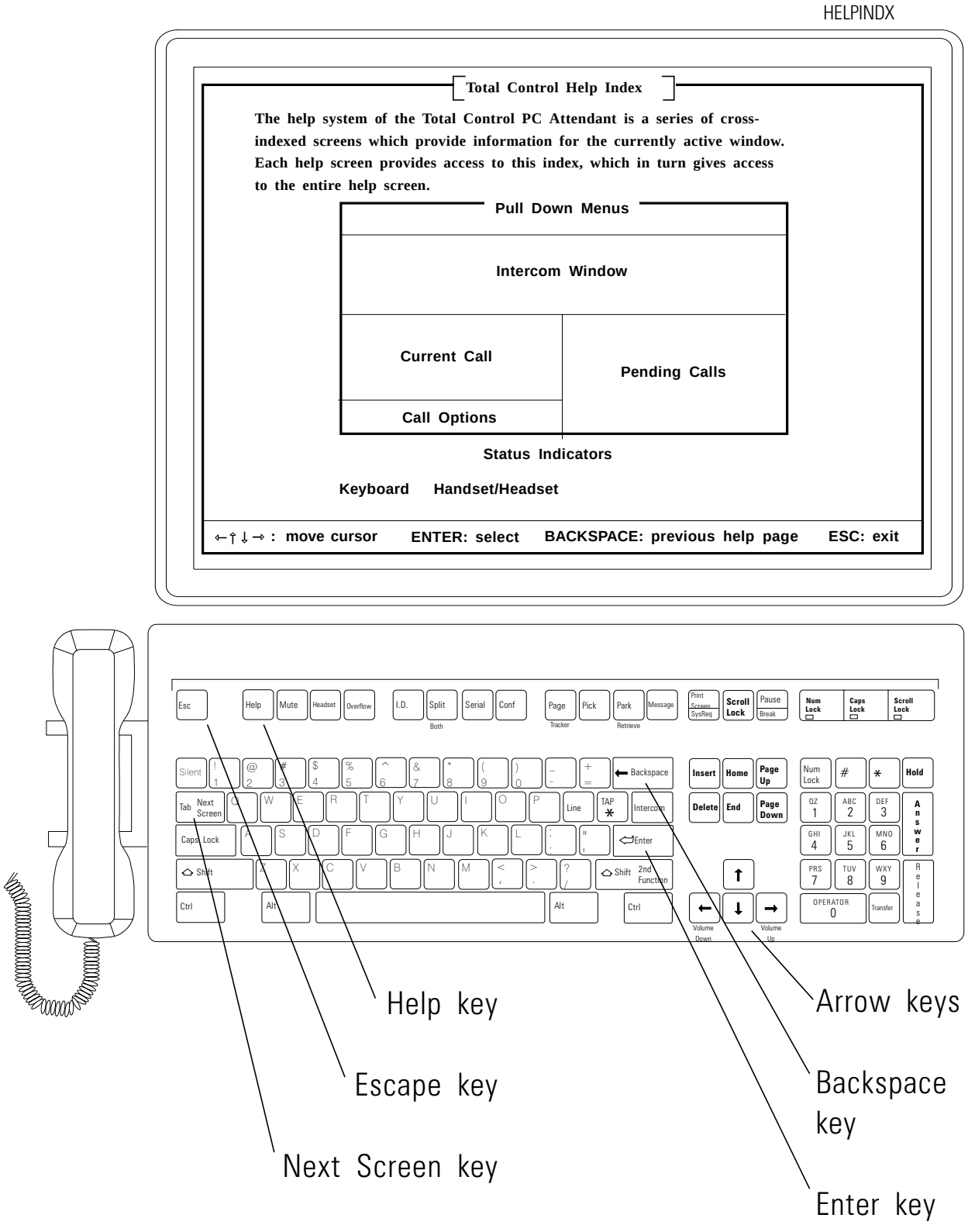
- *To Return To A Previous Help Screen, press* **Backspace**.

- *To Exit The Help Screens, press* **Esc**. *This will return you to the main screen.*

Included on every Help screen is a highlighted Help Index option that, when selected, will display a menu of all available Help screens.

- *To View The Help Index Menu,*

  1. press **Help** (if you have not already activated a Help screen),
  2. use the arrow buttons or the mouse to select the Help Index option,
  3. press **Enter**. (The Help Index screen will display after a short pause.)


HELPINDX
Total Control Help Index
The help system of the Total Control PC Attendant is a series of cross-indexed screens which provide information for the currently active window. Each help screen provides access to this index, which in turn gives access to the entire help screen.
Pull Down Menus
Intercom Window
Current Call
Pending Calls
Call Options
Status Indicators
Keyboard
Handset/Headset
⇐⇑⇓⇒ : move cursor
ENTER: select
BACKSPACE: previous help page
ESC: exit
Help key
Escape key
Next Screen key
Arrow keys
Backspace key
Enter key

1.4 Knowing Your PC Attendant Keyboard

The *Total Control* keyboard is equipped with one-touch function keys for executing most system features. The keyboard diagram on the opposite page identifies the keys; the following list defines their different functions. See the chapters titled *Using The PC Attendant's Other Features* and *Using The PC Attendant To Answer, Direct, And Make Calls* for instructions on how to use these keys to carry out PC Attendant functions.

Answer: answers currently ringing (priority) call.

Arrow Keys: move cursor.

Backspace: causes previous help screen to be displayed. Also used as a true backspace key during text entry.

Both: establishes a conference between the PC Attendant, the current call, and the last call put on hold. Activated by pressing the Shift/2nd Function key and the Split key simultaneously.

Conference: allows attendant to establish a conference call for up to 5 parties on the DXP or up to 7 parties on the DXP *Plus*.

Delete: allows attendant to delete numbers from the Intercom window. Also used to delete Directory entries and to delete characters during text input.

End: moves cursor to the end of current window.

Enter: executes or initiates selected functions.

Escape: returns the PC Attendant to a main screen from a Help screen; allows attendant to move the cursor from the main screen to the pull-down menu bar (and vice versa).

Headset: allows attendant to alternate between handset and headset modes. When headset is activated, handset remains active for listening only.

Help: activates context-sensitive Help screens.

Hold: places current call on hold.

Home: moves cursor to beginning of current window.

I. D. : allows you to enter a short tag or identification (up to 14 characters) to a current call in order to identify the call if it returns to the PC Attendant as a hold recall, transfer recall, park recall, etc.

Intercom: allows attendant to make calls to any extension within the system.

Insert: allows attendant to add extension numbers to Intercom window. Also used to add Directory entries and to insert characters during text entry. In some modes, pressing the Insert key will alternate between insert and typeover functions during typing. The cursor will change height—short for typeover and tall for insert.

Line: allows attendant to make an outgoing (outside) call using a DXP Line Group.

Message: activates a message-waiting light at a station; activates the Take A Message window for text messaging.

Overflow: directs incoming calls to an overflow attendant during peak activity. Calls will ring at both stations simultaneously.

Page: allows attendant to choose a zone in which a paging announcement will occur. After zone is activated, announcement can be made.

Park: activates the Park Orbit window, allowing you to place a call in one of nine park orbits.

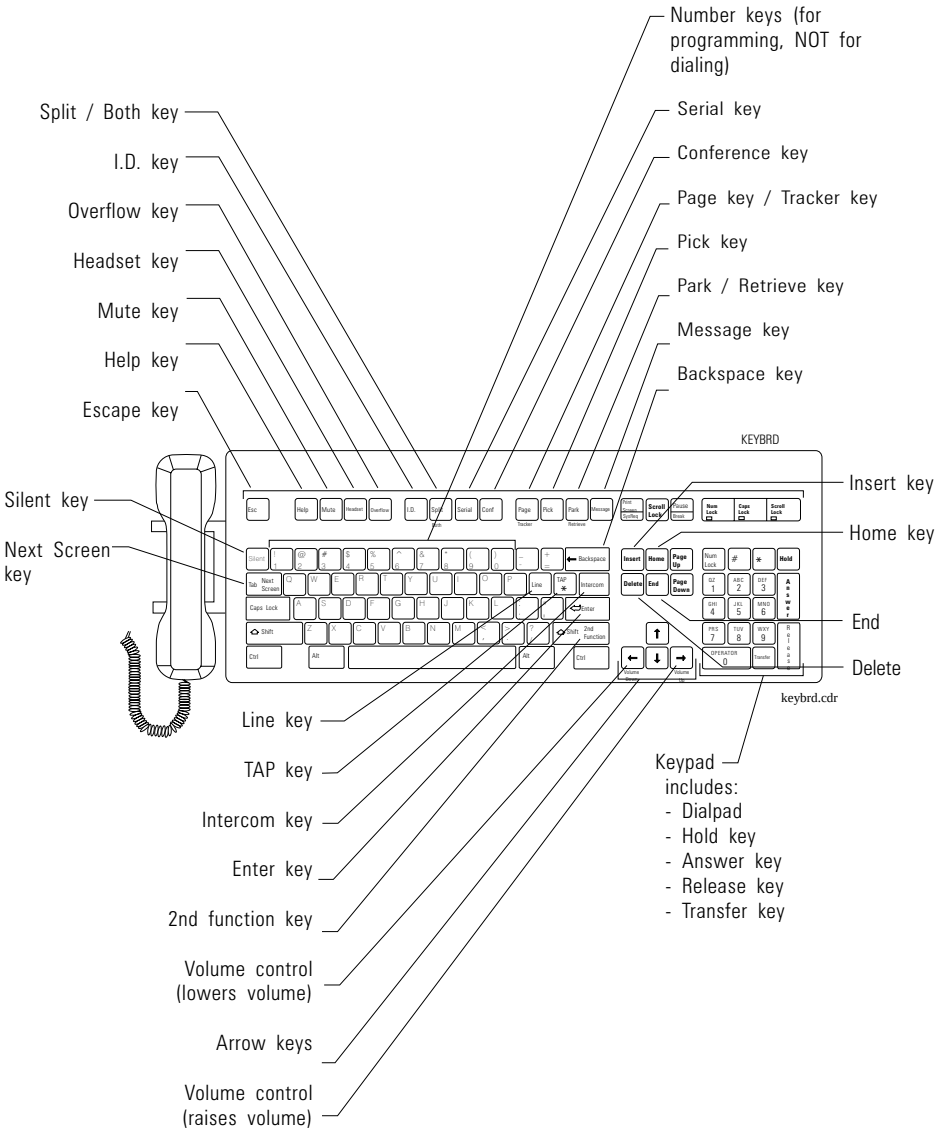
Pick: performs a directed call pick up of a call ringing at another extension.

Release: disconnects current call.

Retrieve: retrieves a call from park orbit. Activated by pressing **Shift/2nd Function** key and **Park** key simultaneously.

Serial: places a call in a series of transfers (to a maximum of three intercoms within the system).
Shift/2nd Function: accesses a key's secondary function (e.g. Retrieve is the secondary function on the Park key) when held down during key selection.
Split: allows attendant to alternate between the current call and the last call that was placed on hold. When one of the calls is activated, the other is automatically placed on hold.
Silent: silences currently ringing call.
Tab/Next Screen: moves cursor to next screen or window.
Tap: retrieves the last call placed on hold, transferred, or parked in orbit.
Tracker: used to page someone using Comdial's Tracker on-site paging sysem (optional).
Transfer: transfers current call to another station.
Volume (Up/Down): controls volume of ringer, handset, and headset (used in conjunction with the "Set Volume" feature in the Options pull-down menu to set default volume levels).

NOTE: Use keypad numbers on the far right of the keyboard for dialing numbers; use number keys above the letter keys to enter numbers during programming modes (such as setting the time and date, entering speed dial numbers, etc.)



2 Handling Calls

2.1 The Intercom Window

The Intercom window displays the current status of 50 to 480 intercom numbers at one time. The optional name display mode will show the status of up to 100 intercom numbers that have been assigned names (*see page 2 - 12*). The names displayed correspond to the station names assigned during DXP programming and are downloaded to your system automatically during start-up; they do not reflect the names assigned by the PC Attendant in the Attendant's Directory. It is a good idea to program the names in the Attendant's Directory so that they match the DXP-programmed names. If you increase the number of lines displayed to 50 (*see page 1 - 2*), you can see all 480 intercom numbers on the screen.

2.1.1 Intercom Screen Attributes

You can determine the status of any intercom simply by noticing how the intercom designation (either name or number) appears in the Intercom window. The following chart lists the screen attributes that pertain to both color and monochrome monitors.

State	Color Monitor	Monochrome Monitor
Idle	White on Blue	Regular Intensity
Ringing	Flashing White on Red	Flashing Bar with Black Type
Busy	Black on Red	Bar with Black Type
Do Not Disturb	Yellow on Blue	High Intensity
Message Waiting	To: White on Green From: Red on Green	Flashing Regular Intensity
More Info	Light Blue on Blue	Underline
No Telephone	Black on Blue	Regular Intensity

NOTE: Screen attributes may vary. See the Intercom window Help screen for your system's current attribute settings. Also, if you are using a monochrome monitor, you may need to adjust the screen (using the contrast and brightness knobs on your monitor) to display the screen attributes correctly.

2.1.2 Intercom Status

If the screen attribute for an intercom indicates "More Info" (see table in section 2.1.1), you can go to the Intercom Status window for that intercom to determine if the station is forwarded, locked, or disabled.

- *To determine the intercom status,*
  1. use the arrow keys or the mouse to move the cursor to the intercom designation (name or number) on the screen list,
  2. press Enter or click the left mouse button. You will see a list of possible intercom status designations with Yes or No tags that tell you whether a feature is turned on or off for that particular extension.
- *To return to the Intercom window, press* **Esc**.

If your system has more than 160 extensions, you may need to view the higher-numbered extensions. To view these numbers at any time, use the arrow keys to move the cursor beyond the right edge of the window.

- *To move the cursor to the highest-numbered intercom (which appears at the end of the intercom list), press* **End**.
- *To move the cursor to the lowest-numbered intercom (which appears at the beginning of the intercom list), press* **Home**.
- *To delete unassigned intercom numbers from your screen,*
  1. with the cursor in the Intercom window, press **Delete**,
  2. type the number that begins the range of numbers to be deleted,
  3. press **Enter**,
  4. type the number that ends the range of numbers to be deleted,
  5. press **Esc** to reconfigure your Intercom window.

NOTE: If you need to add intercom numbers to your screen, follow the above procedure, but press* Insert *instead of* Delete *to initiate the feature.

2.1.3 Intercom Name/Number Selection

The "ITCM Name/Number" selection on the **Options** pull-down menu allows you to change how the system intercoms are displayed in the Intercom window—by name or by number.

- *To activate the* **Options** *pull-down menu from the Intercom window,*

  1. press **Esc**,
  2. use the arrow buttons or the mouse to position the cursor on **Options**,

     —OR—
     press the letter "**O**,"
  3. press **ENTER**.

- *When the* **Options** *menu appears,*

  1. move the cursor to select ITCM Name/Number,
  2. press **Enter**.

2.1.4 Changing A Station's Class Of Service (COS)

You can change a station's COS value from the intercom status window. You might want to change a station's COS in order to change a person's toll restriction. This feature is protected by the station 10 system manager's password. You must enter this password before the COS value change takes effect. The default password is ✳#746✳.

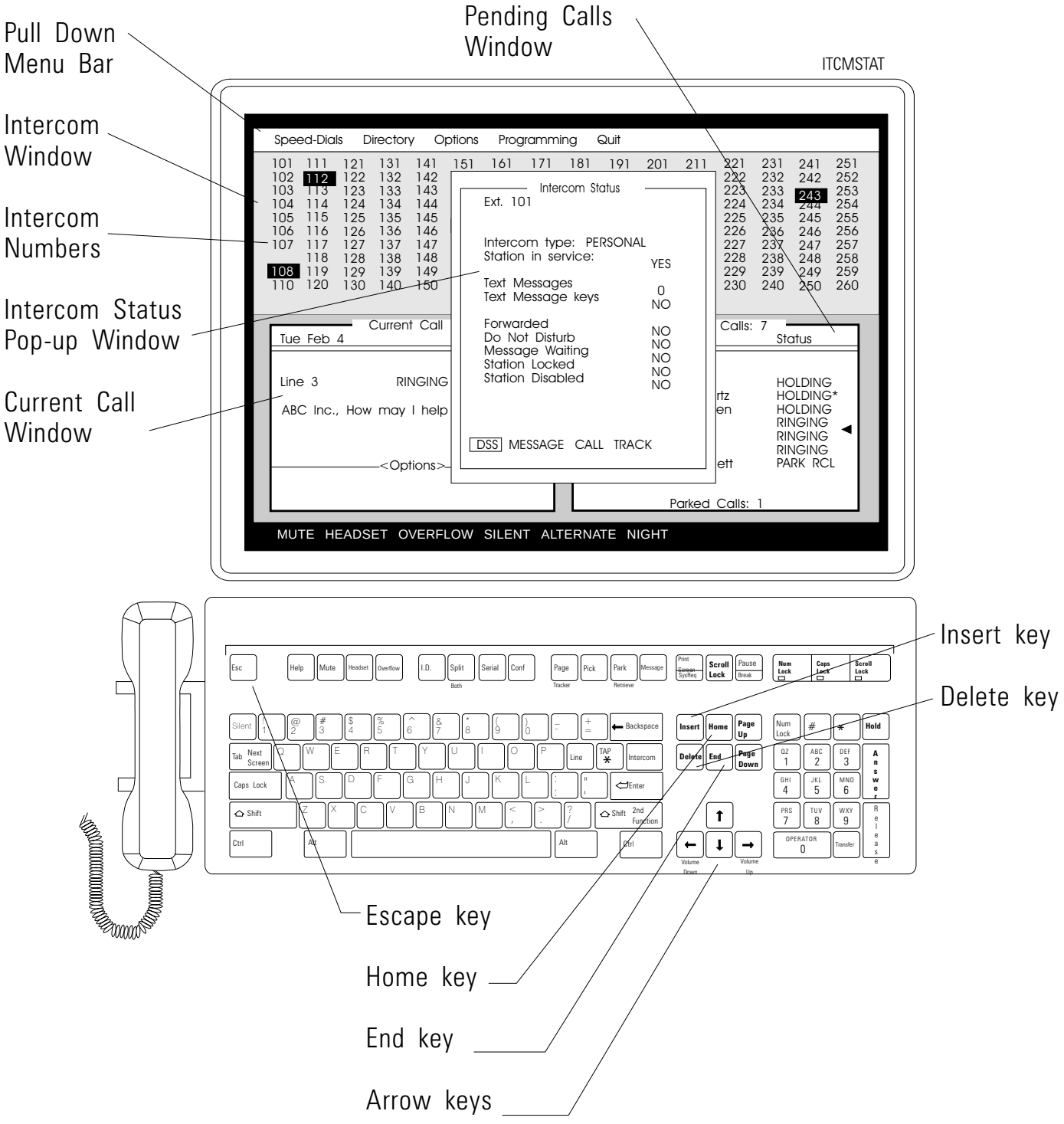
- To assign a new COS to a station from the Intercom Status window,

  1. use the arrow keys or the mouse to move the cursor to the intercom designation (name or number) that you want to change,
  2. press ENTER or click the left mouse button. You will see a list of possible intercom status designations with Yes or No tags that tell you whether a feature is turned on or off for that particular extension,
  3. press the up arrow key to move the cursor to the name field and then press the down arrow to move the cursor to the COS field,
  4. enter the desired COS value,
  5. press ENTER or click the left mouse button,
  6. press ESCAPE to exit the intercom status window,
  7. enter the station 10 system manager password when prompted. An incorrect password will cause an error message to be displayed. If you receive an error message, press any key to return to the password input prompt.

2.1.5 Changing A Station's Name

You can change a station's name from the intercom status window. This feature is protected by the station 10 system manager's password. You must enter this password before the name change takes effect. The default password is ✳#746✳.

- To assign a new name to a station from the Intercom Status window,
  1. use the arrow keys or the mouse to move the cursor to the intercom designation (name or number) that you want to change,
  2. press ENTER or click the left mouse button. You will see a list of possible intercom status designations with Yes or No tags that tell you whether a feature is turned on or off for that particular extension,
  3. press the up arrow key to move the cursor to the name field,
  4. enter the new name,
  5. press ENTER or click the left mouse button,
  6. press ESCAPE to exit the intercom status window,
  7. enter the station 10 system manager password when prompted. An incorrect password will cause an error message to be displayed. If you receive an error message, press any key to return to the password input prompt.


Pull Down Menu Bar
Intercom Window
Intercom Numbers
Intercom Status Pop-up Window
Current Call Window
Pending Calls Window
ITCMSTAT
Speed-Dials Directory Options Programming Quit
Intercom Status
Ext. 101
Intercom type: PERSONAL
Station in service: YES
Text Messages 0
Text Message keys NO
Forwarded NO
Do Not Disturb NO
Message Waiting NO
Station Locked NO
Station Disabled NO
DSS MESSAGE CALL TRACK
Current Call
Tue Feb 4
Line 3 RINGING
ABC Inc., How may I help
<Options>
Calls: 7
Status
HOLDING
HOLDING*
HOLDING
RINGING
RINGING
RINGING
PARK RCL
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT
Insert key
Delete key
Escape key
Home key
End key
Arrow keys

2.2 The Current Call Window

The Current Call window shows the status of the call currently in progress at the PC Attendant console.

When you are on a call or are receiving a call, the Current Call window displays the following information:

- *current call description and status (e.g. Line 1 Ringing),*
- *line greeting or intercom name,*
- *dialed digits or call in transfer,*
- *menu selectable options for the current call (such as Transfer, Park and Release). You may use these options instead of the keys for these features by positioning the cursor on the feature you desire (Transfer, for example) and pressing* **Enter** *to execute,*
- *number of text messages set for a station (when that station is on an intercom call).*

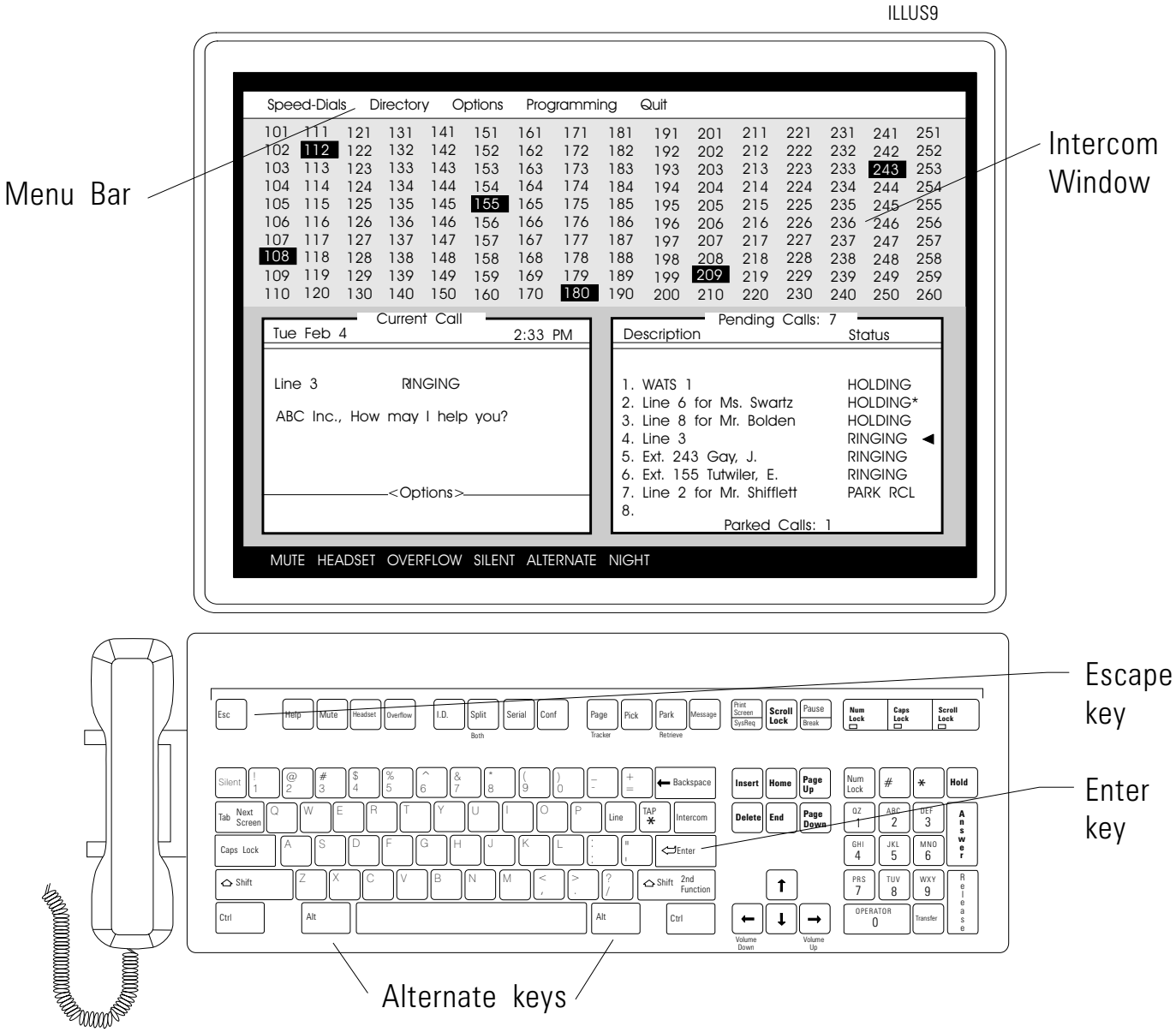
If there is no call in progress, the Current Call window displays the status of the call highlighted in the Pending Calls window (a call on hold, for example). If you move the cursor up or down in the Pending Calls window, the Current Call window changes to reflect the highlighted selection in the Pending Calls window.

2.3 The Pending Calls Window

The Pending Calls window shows the status of up to eight calls that are either ringing, holding, recalling, or currently connected to the PC Attendant station. Additional calls will not display in the Pending Calls window until one of the first eight calls is serviced. The pending call count at the top of the window shows the total number of pending calls waiting to be serviced.

When one or more calls are ringing at the PC Attendant station, a flashing arrow will appear to the right of the call that is audibly ringing (the highest- priority call). This is the call that will connect to the PC Attendant station when the **Answer** key is pressed. If you prefer to answer one of the other (lower-priority) calls ringing at your station, simply move the cursor in the Pending Calls window to highlight the call you want to answer and press **Enter**.

When one or more calls are holding at the PC Attendant station, an asterisk (∗) will be displayed next to the last call placed on hold. This is the call that will connect to the PC Attendant station when the **Tap** key is pressed. If you prefer to answer another held call (one with no asterisk next to it), simply move the cursor in the Pending Calls window to highlight the held call you want to answer and press **Enter**.


ILLUS9
Menu Bar
Intercom Window
Escape key
Enter key
Alternate keys
Speed-Dials Directory Options Programming Quit
Current Call
Tue Feb 4 2:33 PM
Line 3 RINGING
ABC Inc., How may I help you?
<Options>
Pending Calls: 7
Description Status
1. WATS 1 HOLDING
2. Line 6 for Ms. Swartz HOLDING*
3. Line 8 for Mr. Bolden HOLDING
4. Line 3 RINGING
5. Ext. 243 Gay, J. RINGING
6. Ext. 155 Tutwiler, E. RINGING
7. Line 2 for Mr. Shifflett PARK RCL
8.
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT

2.4 Line Access Window

The Line window is located under the options menu and displays the current status of up to 48 lines. As an alternative to the Line window, the optional name display mode will show the status of up to 48 lines with their associated names. The default number of lines displayed on the PC Attendant screen is 25; the display can be changed to show either 43 or 50 lines (*see page 1 - 2)*. You can switch between number and name display mode by using the Line Name / Number selection of the Options pull down menu.

The line window appears in the right hand corner of the Intercom window and automatically sizes itself depending upon the number of lines used. You can determine the status of a given line by noticing how the line designation appears in the Line window. The following chart lists the screen attributes that pertain to both color and monochrome monitors.

State	Color Monitor	Monochrome Monitor
Idle	Black on Cyan	Regular Intensity
Ringing	Flashing White on Red	Flashing Reverse Video
Busy	Black on Red	Reverse Video
On-Hold	Cyan on Black	High Intensity
Recalling	Flashing Red on Cyan	Flashing

2.4.1 Line Status Menu

The Line Status menu gives detailed information on the status of a particular line; it also gives the attendant the choice of testing that line or picking it up.

NOTE: You only need steps 1 – 4 if the line window is not currently being displayed.

- *To access the line status menu,*

1. activate the Options menu,
2. press **ALT–O** and press **Enter**,

   —OR—

   press **Esc** to move the cursor into the menu bar from the main screen; position the cursor on "Options," and press **Enter**,
3. move the cursor to highlight Line Access,
4. press **Enter** (move the cursor into the line window if necessary),
5. select line,
6. press **Enter.**

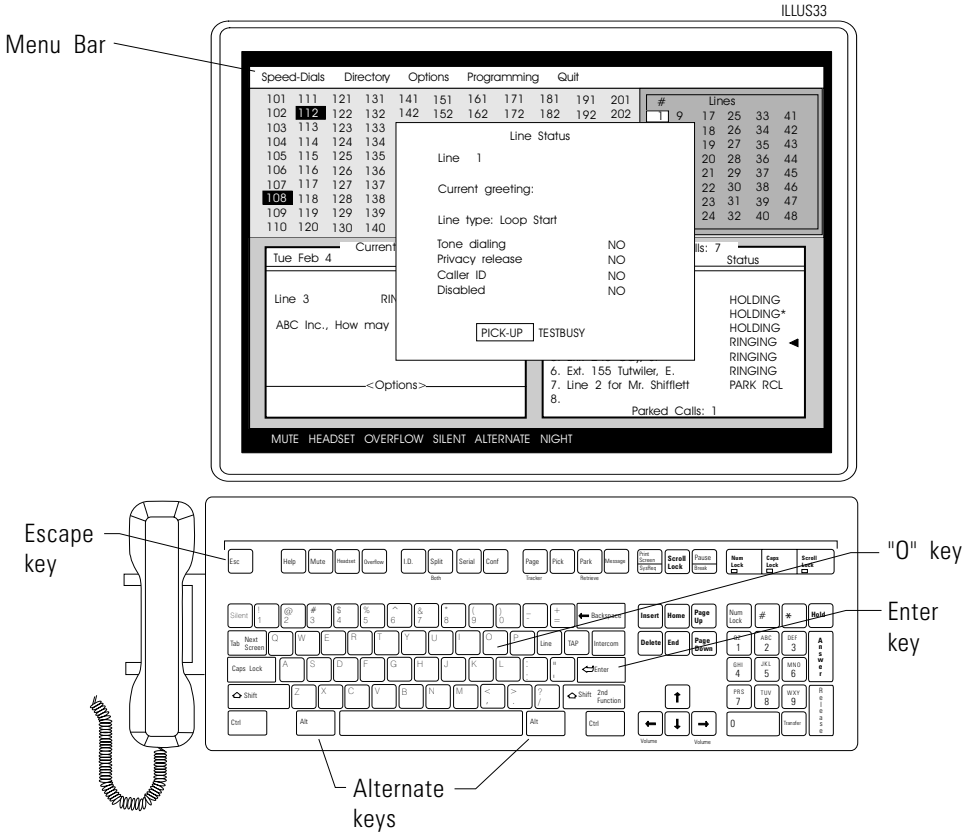
2.4.2 Test Busy

You can check the status or accessibility of any DXP line from the PC Attendant console.

NOTE: You only need steps 1 – 4 if the line window is not currently being displayed.

- **To check line status,**
  1. **activate the Options menu,**
  2. **press ALT–O** and press **Enter**,

     —OR—
     press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Options", and press **Enter**,
  3. move the cursor to highlight Line Access,
  4. press **Enter**,
  5. select line,
  6. press **Enter**,
  7. after Line Status menu appears, highlight Test Busy,
  8. press **Enter**.



2.5 Answering And Directing Calls

2.5.1 Answering Incoming Calls

When a call rings at the PC Attendant console, it will appear (with a description of its origin) in both the Current Call window and the Pending Calls window and will have a flashing arrow next to it. (It will also be an audibly ringing call.)

- *To connect this call to the PC Attendant station, press* **Answer**.

- *To connect another incoming call before connecting to the audibly ringing call, press* ***Tab/Next Screen*** *to activate the cursor in the Pending Calls window, move the cursor to select the call you wish to connect and press* **Enter**.

2.5.2 Holding Calls

Current calls can be put on hold at the PC Attendant station. The last call placed on hold will appear in the Pending Calls screen with an asterisk (*) next to it and can be reconnected by pressing the **Tap** key.

- *To place a current call on hold, press* **Hold**. *The call will appear in the Pending Calls window with an asterisk (*) next to it.*

- *To reconnect to this call, press* **Tap**.

- *To reconnect to any other call placed on hold at the PC Attendant station,*

  1. press **Tab/Next Screen** to activate the cursor in the Pending Calls window (if the cursor is not already in that window),
  2. move the cursor to select the holding call you wish to reconnect,
  3. press **Enter**.

2.5.3 Handling / Recalling Hold Calls

The DXP system programmer sets the hold recall timer as well as other system parameters that affect how calls are handled by the system.

After a call has been on hold for a pre-programmed length of time, the call will recall to the PC Attendant station, causing an audible signal to sound. The hold recall will also appear in the Pending Calls window with the indication "HOLD RCL" and a flashing green arrow next to it (if it is the highest priority call).

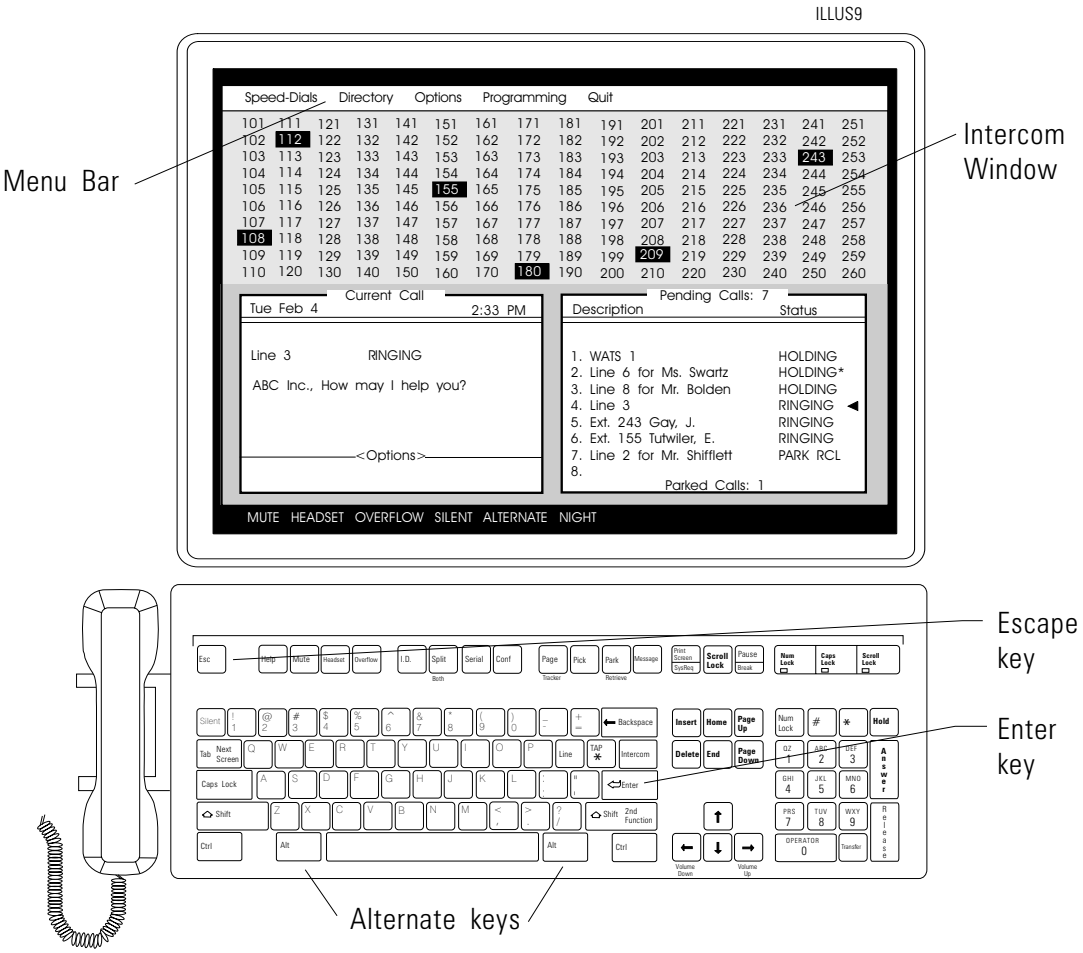
When more than one call is recalling from hold, the flashing arrow will appear next to the first call placed on hold.

- *To answer this hold recall call, press* **Answer**.

- *To answer any other hold recall,*

  1. press **Tab/Next Screen** to activate the cursor in the Pending Calls window (if not already activated there),
  2. move the cursor to select the holding call you wish to reconnect,
  3. press **Enter**.

After you reconnect the PC Attendant station to any held call, you may press **Hold** to return the call to hold status and thus restart the hold recall timer.



2.5.4 Parking Calls

A current call can be placed in one of nine "park orbits" within the system. This allows the call to be answered from any station if the person at that station knows the orbit code to dial in order to retrieve the call.

- *To place a call in a park orbit (while connected to the call),*

1. press **Park** to activate the Park Orbits window,
2. if necessary, move the cursor to select an available park orbit for the call,
3. press **Enter** (Make a paging announcement, if necessary, to tell the called party which park orbit the parked call is in.)**,**
4. **You may press Esc** to exit the Park Orbits window without parking the call.

A parked call will remain in park orbit for a set period of time. After that time is up, the call will recall to the PC Attendant station.

2.5.5 Retrieving Parked Calls

When a parked call recalls to the PC Attendant station, the Pending Calls window will display the call with the tag "PARK RCL" and a flashing arrow (if it is the highest priority call).

- *To answer a park recall, press* **Answer**.

Calls placed in Park Orbit can be retrieved before they are "timed out" of Park Orbit and recalled to your station.

- *To retrieve any parked call,*

1. press **Shift/2nd Function** and **Park** at the same time (this activates the **Retrieve** function),
2. position the cursor in the Park Orbits window on the call you wish to retrieve,
3. press **Enter**.

2.5.6 Transferring Calls

You may transfer a current call to any intercom within the system.

- *To transfer a current call,*

  1. while on the call, press **Trans** and dial intercom number using the dial pad, or type in the name of the station user receiving the call and press **Enter**. (Once you type in the first initial of the name, the system will display all of the names beginning with that letter—in case you are unsure of a name's spelling),
  2. for an *unscreened transfer*, press **Release** to complete the transfer after you hear ringing at the called station,
  3. for a *screened transfer*, wait for the called party to answer, announce the call, then press **Release** to complete the transfer.

If you attempt to make a screened transfer and there is no answer at the called station, you can return to the call by pressing **Tap**.

If you make an unscreened transfer to a station that does not answer the transfer call, the transfer will recall to the Attendant's station after a set period and will appear in the Pending Calls window as a transfer recall.

- *To answer a Transfer Recall, press* **Answer**.

NOTE: If you need to retrieve an unanswered transfer call before it recalls to your station, you may use the PICK feature, which is described in the chapter titled "Using The PC Attendant's Other Features." Transferring calls using the the Dial-By-Name feature is also discussed in that chapter. You can also use the TAP key to retrieve a transferred call before it is answered.

2.5.7 Using The Pager—Tracker

The *Tracker* paging system allows you to send either an alphanumeric or numeric (depending upon the pager) message to a pocket-pager assigned to a DXP extension. The **Track** option on the Intercom-status window only appears if that intercom number has *Tracker* enabled.

- *To send a message through Tracker using the Intercom-status window,*

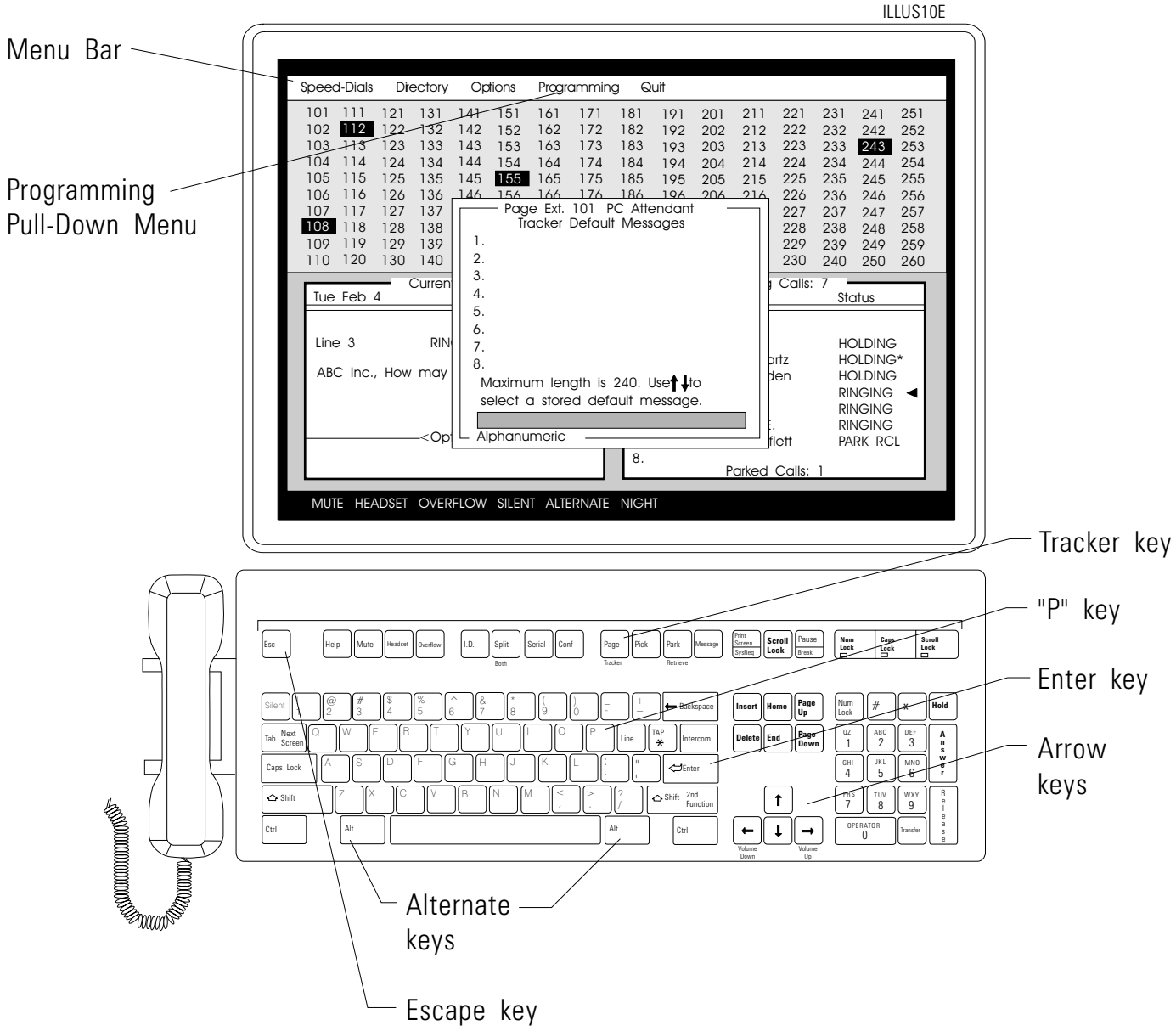
  1. use the arrow keys or the mouse to move the cursor to the intercom designation (name or number) on the screen list,
  2. press **Enter** to access the Intercom-status window,
  3. move the cursor to highlight **Track**,
  4. after Tracker menu appears, select appropriate pre-set message using the up and down arrow keys (the system will display only messages that match the pager type; also, you can edit a defaulted message once you select it),
     —OR—
     type new message,
  5. press **Enter** to send the message.

NOTE: Some pagers accept longer messages than the PC Attendant's screen allows; for these pager types the message scrolls to the left as you enter message information.

- *To send a message through Tracker using the Tracker key,*

  1. use the arrow keys or the mouse to move the cursor to the intercom designation (name or number) on the screen list,
  2. press and hold the **Shift** key,
  3. press **Page (Tracker)** key**,**
  4. **after Tracker menu appears, highlight appropriate pre-set message using the up and down arrow keys (the system will display only messages that match the pager type; also, you can edit a defaulted message once you select it),**
     —OR—
     type new message,
  5. **press Enter** to send the message.

NOTE: Some pagers accept longer messages than the PC Attendant's screen allows; for these pager types, the message scrolls to the left as you enter message information.


ILLUS10E
Menu Bar
Programming Pull-Down Menu
Speed-Dials
Directory
Options
Programming
Quit
Page Ext. 101 PC Attendant
Tracker Default Messages
Maximum length is 240. Use ↑↓ to select a stored default message.
Alphanumeric
Tue Feb 4
Status
Line 3
ABC Inc., How may
HOLDING
HOLDING*
HOLDING
RINGING
RINGING
RINGING
PARK RCL
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT
Tracker key
"P" key
Enter key
Arrow keys
Alternate keys
Escape key

2.6 Making Calls

2.6.1 Making Intercom Calls

- *To call another station,*

  1. press **Intercom**,
  2. dial intercom number,

     —OR—

     position cursor on desired intercom number in Intercom window,
  3. press **Enter** twice,

     —OR—

     use the mouse to select the intercom number from the Intercom window,
  5. click the left mouse button twice.

2.6.2 Making Outside Calls

- *To make an outside call,*

  1. press **Line**,
  2. dial number from dial pad.

2.6.3 Creating Conference Calls

From the PC Attendant console, you may initiate a conference call for up to five parties if you are using the DXP, or up to seven parties if you are using the DXP *Plus* (the call can consist of any combination of outside and inside numbers, or can consist of inside numbers only).

- *To create a conference call,*
  1. while on current call, press **Conf**,
  2. dial intercom call (intercom tone is automatic) or press **Line** for outside call,
  3. dial telephone number or intercom number from dial pad,
  4. after called party answers, press **Conf**,
  5. repeat procedure to create a conference for up to five conferees (including yourself).

Occasionally, you may be asked to set up a conference for other people and then (once the conference is established) leave the conference with the person who originally requested it.

- *To create an unsupervised conference,*
  1. confirm that conference is connected,
  2. press **#** (on the keypad).
- *To transfer a conference to another station,*
  1. confirm that conference is connected,
  2. add the desired station into the conference using the steps described above,
  3. when called station answers, announce that the conference is arranged and press **#** (on the keypad). The conference will then connect to the called station.
- *To park a conference call in a park orbit for pick up at any station,*
  1. while connected to the conference, press **Park** to activate Park Orbits window,
  2. move the cursor to the desired park orbit,
  3. press **Enter**. (Make a paging announcement if necessary to tell the called party which park orbit the parked conference is in.)

2.6.4 Disconnecting From A Call

When you complete a call or a transfer, you will need to disconnect from the call.

- *To disconnect a current call from the PC Attendant console, press* **Release** *or click the right-hand mouse button once.*

2.7 Using The Pull-Down Menus

The *Total Control* PC Attendant console is equipped with on-screen pull-down menus that allow you to perform a variety of system operations and programming functions. The menus are as follows (in order from left to right in the top bar of the main screen):

— Speed Dials
— Directory
— Options
— Programming
— Quit

- *To access the pull-down menus,*

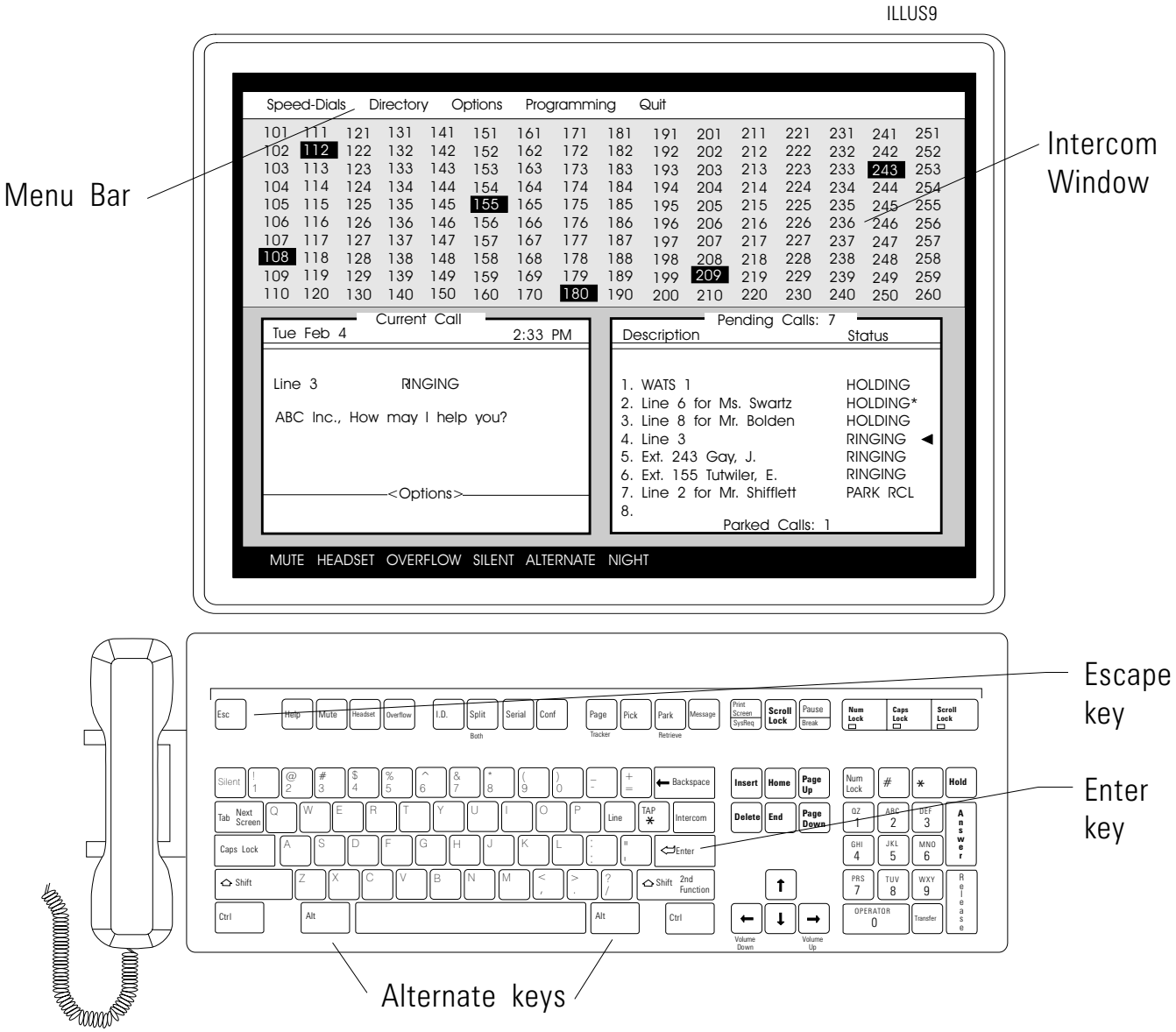
  1. press **Alt** and the first letter of the menu name simultaneously (e.g. press **Alt**-**P** for the Programming menu),
     —OR—
  2. press **Esc** to move the cursor into the pull-down menu bar at the top of the main screen,

     position the cursor on the menu you wish to view,
     press **Enter** (a pull-down menu will appear),
     move the cursor to the feature you wish to access,
     press **Enter**. A feature window will appear.

- *To exit a pull-down menu, press* **Esc**. *(Press* **Esc** *again to return the cursor to the Intercom window on the main screen.)*

NOTE: You may also use the mouse to access the pull-down windows by pointing and clicking on the desired menu heading and menu selections. To exit the menus with the mouse, click outside the menu on to another main window.

ILLUS9


Menu Bar
Intercom Window
Escape key
Enter key
Alternate keys
Speed-Dials Directory Options Programming Quit
Current Call
Tue Feb 4 2:33 PM
Line 3 RINGING
ABC Inc., How may I help you?
<Options>
Pending Calls: 7
Description Status
1. WATS 1 HOLDING
2. Line 6 for Ms. Swartz HOLDING*
3. Line 8 for Mr. Bolden HOLDING
4. Line 3 RINGING
5. Ext. 243 Gay, J. RINGING
6. Ext. 155 Tutwiler, E. RINGING
7. Line 2 for Mr. Shifflett PARK RCL
8.
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT

2.7.1 Using The Pull-Down Menu Features

Speed Dials

You can use the Speed Dials pull-down menu to view and/or dial one of 200 pre-programmed DXP system speed dial numbers.

Directory

Selecting the Directory pull-down menu activates a window that contains lines and columns for you to enter the appropriate intercom names and numbers for your system (see 3.1.4 “Directory—Creating And Editing”) . The Directory pull-down menu can be used to dial an intercom number—simply position the cursor on the desired number and press **Enter**.

The Directory is the source from which you dial when you activate the Dial-By-Name feature (discussed in the chapter titled *Using The PC Attendant’s Specialized Features*); however, the names assigned to intercom numbers displayed in the Intercom window are a product of DXP programming. It is a good idea, therefore, to enter the Directory names so that they coincide with the intercom names assigned during DXP programming. Obtain a list of intercom names from your system programmer or installer.

Options

The Options menu provides access to lesser-used options than those one-touch features found on the keyboard. Specific instructions on how to use the options are found in the *Using The PC Attendant’s Other Features* chapter of this guide, unless otherwise noted.

Line Access: Provides a visual indication of the status of the lines.

Paging: selecting this option allows you to choose a zone in which your announcement will be heard. (Zone 1 is typically used for all-call paging.)

Park Retrieve: activates the Park Orbits window, which tells you the location of currently parked calls awaiting service. For information on how to use this window to retrieve a parked call, refer to the *Using The PC Attendant To Answer, Direct, And Make Calls* chapter of this guide.

Alternate Mode: selecting Alternate Mode from the Options menu routes the functions of the PC Attendant to an alternate attendant. Choosing this option a second time returns all call activity to the PC Attendant console.

Night Mode: selecting Night Mode transfers the PC Attendant’s call activity to a designated night attendant station or to the DXP system, which sounds a tone when incoming calls are received so that the calls may be picked up from any telephone within the system or group.

ITCM Names/Numbers: selecting this option changes the current Intercom window display from names to numbers or from numbers to names. The names and numbers are supplied through DXP programming. If an intercom has no name assigned to it, only the number will appear when “Names” is selected.

Line Names/Numbers: selecting this option changes the current Line window display from names to numbers or from numbers to names. The names and numbers are supplied through DXP programming. If a line has no name assigned to it, only the number will appear when “Names” is selected.

PC Settings: allows you to activate a “screen saver” that should be turned on when the PC Attendant console is to be idle for a period of time.

Programming

The Programming menu allows you to access programming functions that set the System's parameters. The options include the following:

- **Set Date/Time**
- **Set Volume**
- **Speed Dials**
- **Line Greetings**
- **Other Greetings**
- **Text Messaging**
- **Keyboard Macros**
- **Tracker**

NOTE: Please refer to the Setting System Parameters chapter of this guide for information on how to use the features in the Programming menu.

Quit

Selecting **Exit PC Attendant** allows you to exit the PC Attendant system so that DXP system programming can occur (this is an installer activity).

To exit the PC Attendant console, choose **EXIT PC Attendant** from the Quit pull-down menu.

Re-enter the system by following the procedure outlined under "Installing The Software" in the chapter entitled *Getting Started*. The PC Attendant console will be unable to perform any attendant functions until the software is installed.

2.8 Setting The System Parameters

2.8.1 The Programming Menu

The system parameters on the following pages are set through the options on the Programming pull-down menu. Be sure to use only the number keys above the letter keys on the keyboard for programming; the dial pad numbers on the right side of the keyboard are for dialing only.

- *To access the Programming pull-down menu*,

  1. press **ALT-P** and press **Enter**,

     —OR—

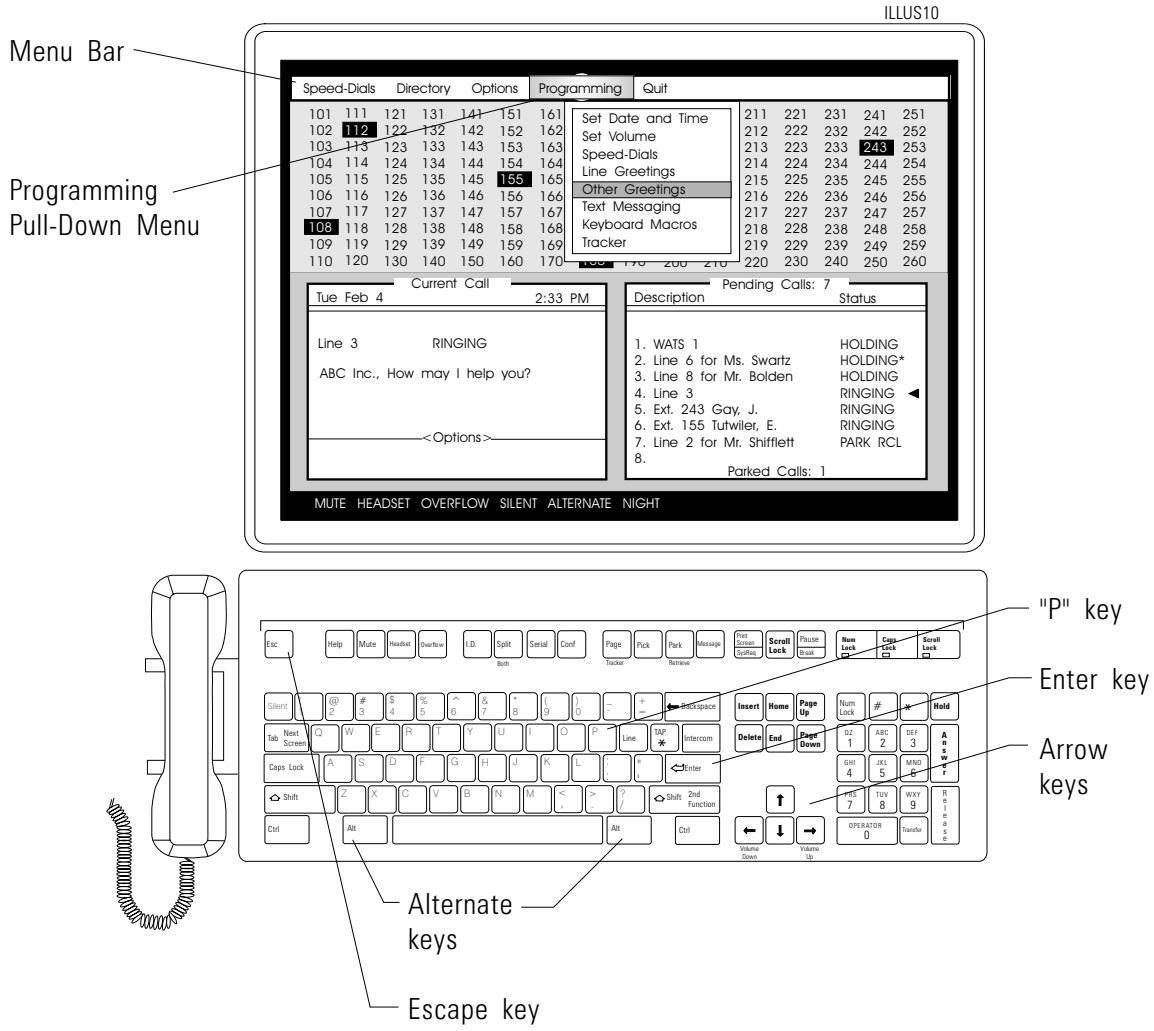
     press **Esc**,

  2. using the arrow keys, position the cursor on "Programming" in the menu bar,

  3. press **Enter** (the programming menu will appear),

  4. move the cursor to the feature you wish to activate,

  5. press **Enter**. A feature window will appear.



2.8.2 Setting The Date And Time

The current date and time appear in the Current Call window when the main screen is displayed.

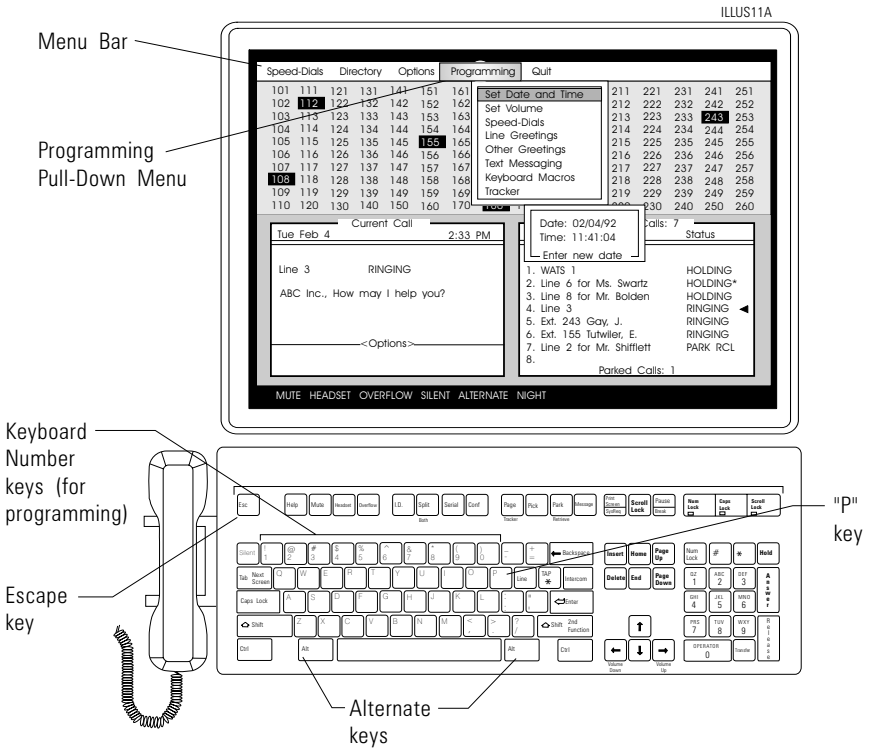
- *To change the date and time,*

1. activate the Programming pull-down menu,
2. press **ALT-P** and press **Enter**,

   —OR—

   press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,
3. move the cursor to highlight "Set Date and Time,"
4. press **Enter** (a small Date and Time window will appear),
5. type in the new date,
6. press **Enter** to position the cursor on the "Time" line,
7. type in new time,
8. press **Enter** to save the changes (Date and Time window will disappear),
9. press **Esc** twice to return the cursor to the Intercom window. The corrected date and time will now appear in the Current Call window.

NOTE: This change also resets the DXP system date and time designation.



2.8.3 Setting The Volume

The PC Attendant's handset and headset have a single volume control with seven separate levels that can be adjusted through the Programming menu option "Set Volume." As well, the ringer volume at the PC Attendant console can be adjusted separately through this menu option.

- *To change the handset/headset or ringer volume,*

  1. activate the Programming pull-down menu,

  2. press **ALT-P** and press **Enter**,

     —OR—
     press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,

  3. move the cursor to highlight "Set Volume,"

  4. press **Enter** (a small window containing volume designations for the handset/headset and ringer will appear),

  5. use the left and right arrow buttons to increase or decrease the volume for the handset/headset,

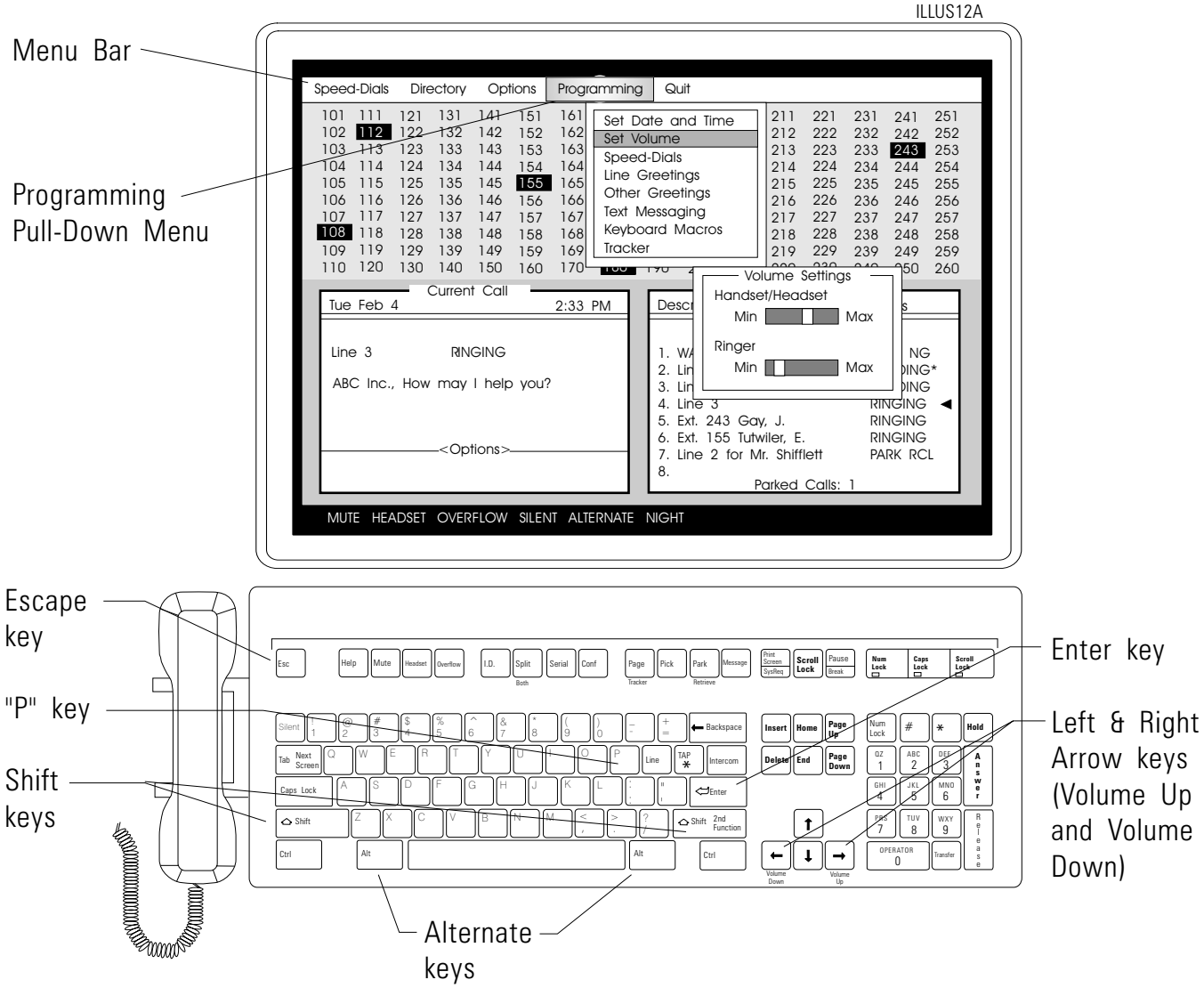
  6. press **Enter** (the cursor will move to the ringer volume line),

  7. adjust the ringer volume,

  8. press **Enter** to save the volume changes and return to the programming menu,

  9. press **Esc** twice to return the cursor to the Intercom window. The change in volume will remain until you elect to change it again.

NOTE: If you activate the Volume window and decide not to change the volume settings, simply press Esc twice to return to the Intercom window.
Also, headset and handset volume can be adjusted at any time (e.g. while you are on a call) by pressing Shift and the left or right arrow key. This setting remains for the duration of the current call. After the current call is complete, the headset and handset volume revert to the settings found in the programming pull-down menu.


ILLUS12A
Menu Bar
Programming Pull-Down Menu
Escape key
"P" key
Shift keys
Alternate keys
Enter key
Left & Right Arrow keys (Volume Up and Volume Down)
Speed-Dials
Directory
Options
Programming
Quit
Set Date and Time
Set Volume
Speed-Dials
Line Greetings
Other Greetings
Text Messaging
Keyboard Macros
Tracker
Volume Settings
Handset/Headset
Min
Max
Ringer
Min
Max
Current Call
Tue Feb 4
2:33 PM
Line 3 RINGING
ABC Inc., How may I help you?
<Options>
4. Line 3 RINGING
5. Ext. 243 Gay, J. RINGING
6. Ext. 155 Tutwiler, E. RINGING
7. Line 2 for Mr. Shifflett PARK RCL
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT

12a

2.8.4 System Speed-Dial Directory—Editing and Creating

System speed dials (the DXP system provides 200 such numbers, the DXP *Plus* allows for 500) allow you and the other users in your system to make outside calls without dialing an entire telephone number. The Speed Dials option on the Programming pull-down menu allows you to program or edit speed dial numbers. If your system has software release 7A or later, you must enter your station 10 password to edit speed dial numbers. This is not required on systems using earlier software.

- *To create or edit a system speed dial,*

1. activate the Programming pull-down menu,

2. press **ALT-P** and press **Enter**,

   —OR—

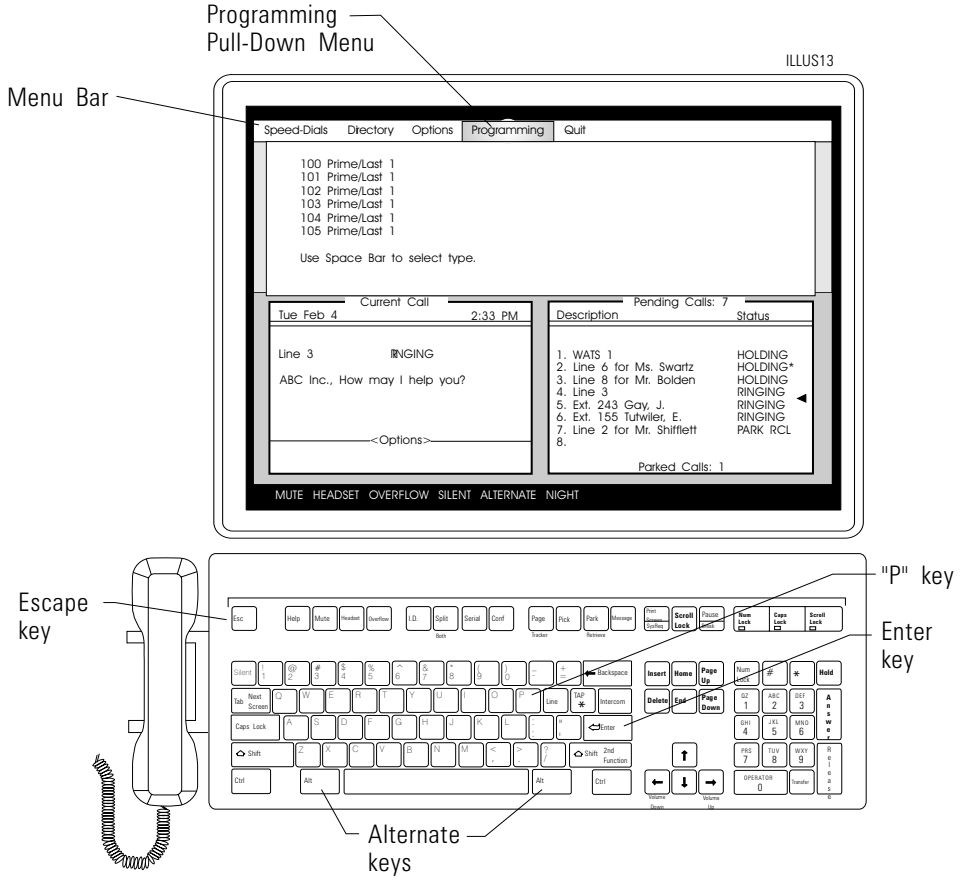
   press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,

3. move the cursor to highlight "Speed Dials,"

4. press **Enter,**

5. type the correct information in the cells provided. Move among the cells using the **Enter** key, and the **Shift/2nd Function** key (held down) and the **Tab** key together.

NOTE: Refer to the chapter titled* Using The PC Attendant's Specialized Features *for information on speed-dialing from the PC Attendant console.



2.8.5 Line Greetings

As an attendant, you may be called on to answer lines for many different departments or divisions within the same company, or you may need to answer telephones for more than one company. When call traffic is heavy, it's not always easy to remember what you are supposed to say when answering a particular line (for example, "ABC Marketing" may be the required greeting on one line, and "ABC Company—How may I direct your call?" may be required on another).

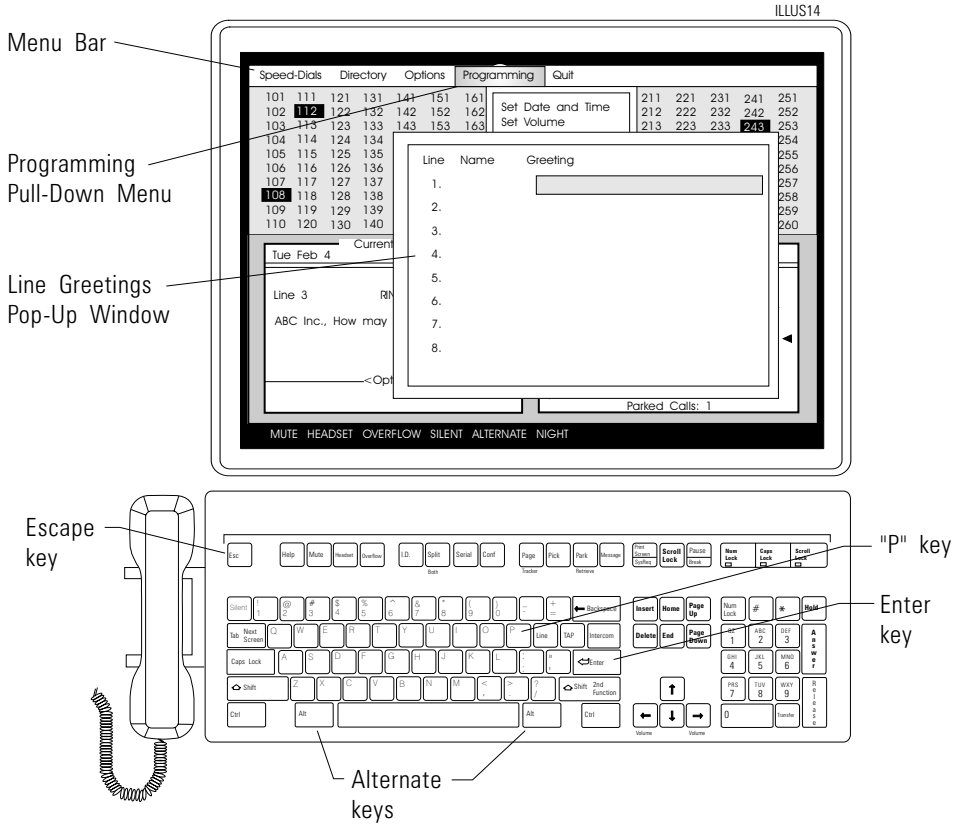
Line greetings are designed to give you an immediate indication of the greeting required for a particular line.

- *To program line greetings for the different lines within your system,*
  1. activate the Programming pull-down menu,
  2. press **ALT-P** and press **Enter**,

     —OR—

     press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,
  3. move the cursor to highlight "Line Greeting,"
  4. press **Enter**,
  5. type the line greetings necessary for each line,
  6. press **Enter** (cursor will move down the line list),
  7. type other greetings or press **Esc** to exit.

NOTE: Lines are numbered 1, 2, 3, etc. and correspond directly to your outside incoming lines; entering the phrase "Hello, how may I help you?" on line 1 of the window will cause that phrase to appear in the Current Call window when an outside call rings on Line 1.



2.8.6 Other Greetings

When a system has DID (Direct Inward Dialing) lines, those lines can be set by your installer to ring directly at the PC Attendant. If the DID lines come to the PC, you can set different greetings for each DID line.

- *To program greetings for DID lines,*

  1. activate the Programming pull-down menu,

  2. press **ALT-P** and press **Enter**,

     —OR—
     press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,

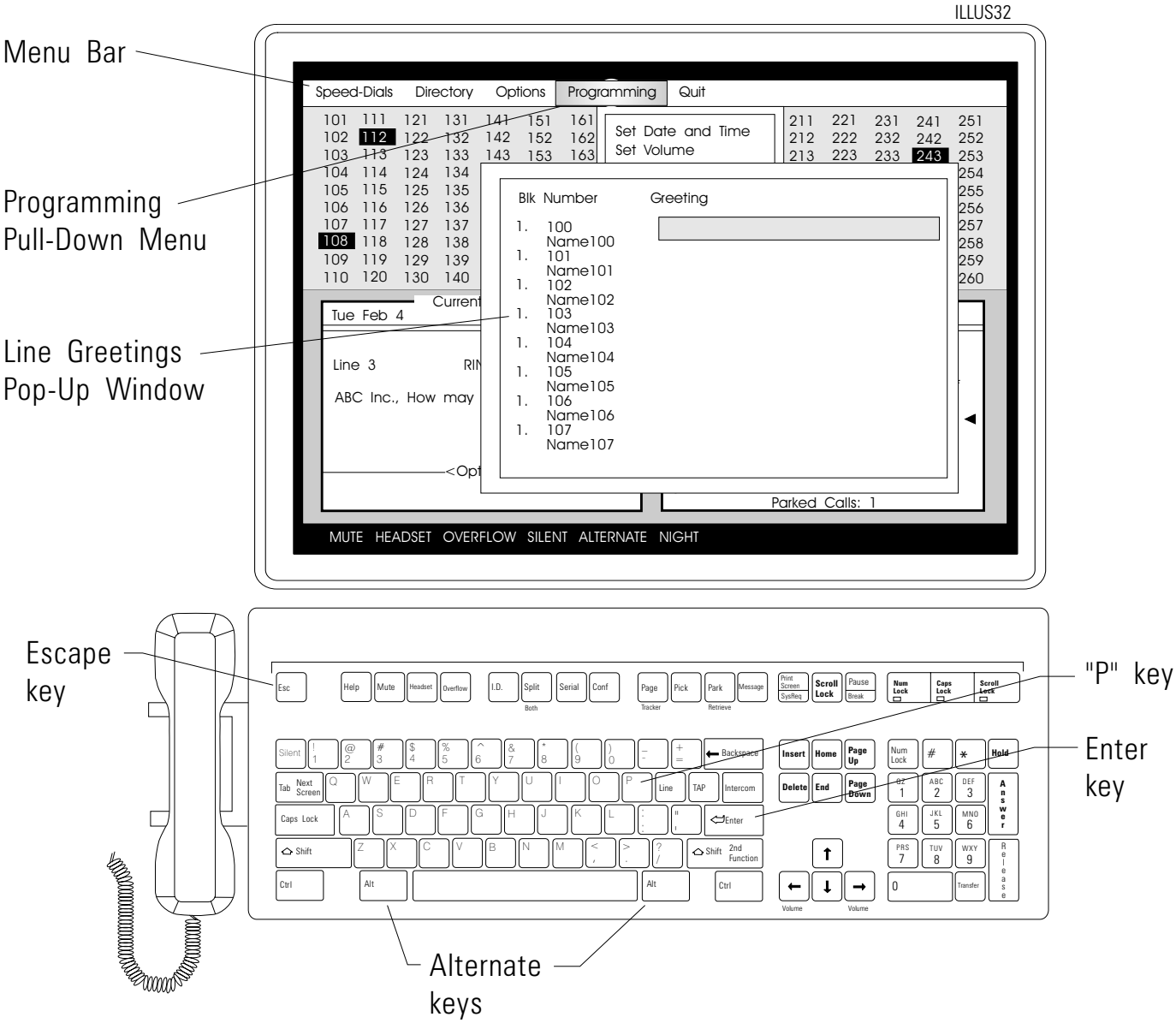
  3. move the cursor to highlight "Other Greetings,"

  4. press **Enter**,

  5. type the greetings necessary for each DID number,

  6. press **Enter** (cursor will move down the line list),

  7. type other greetings or press **Esc** to exit.


ILLUS32
Menu Bar
Programming Pull-Down Menu
Line Greetings Pop-Up Window
Escape key
"P" key
Enter key
Alternate keys
Speed-Dials
Directory
Options
Programming
Quit
Set Date and Time
Set Volume
Blk Number
Greeting
Tue Feb 4
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT

2.8.7 Keyboard Macros

The Macro Programming menu allows you to program up to 10 custom key–sequences (each containing up to 20 entries) that you can then play back with single–key access. You can set a keyboard macro to perform any one of several functions, (ALT 1 = Hold, ALT 2 = Tap, ALT 3 = Transfer, for example). If you insert more than 20 entries, the system will automatically drop the last event (number 20) when you insert the new one.

- *To program a keyboard macro,*

1. activate the Programming pull-down menu,
2. press **ALT-P** and press **Enter**,

   —OR—

   press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,
3. move the cursor to highlight "Keyboard Macros,"
4. press **Enter**,
5. highlight the macro key you wish to program,
6. press **Enter**—the macro editing window for that macro appears.

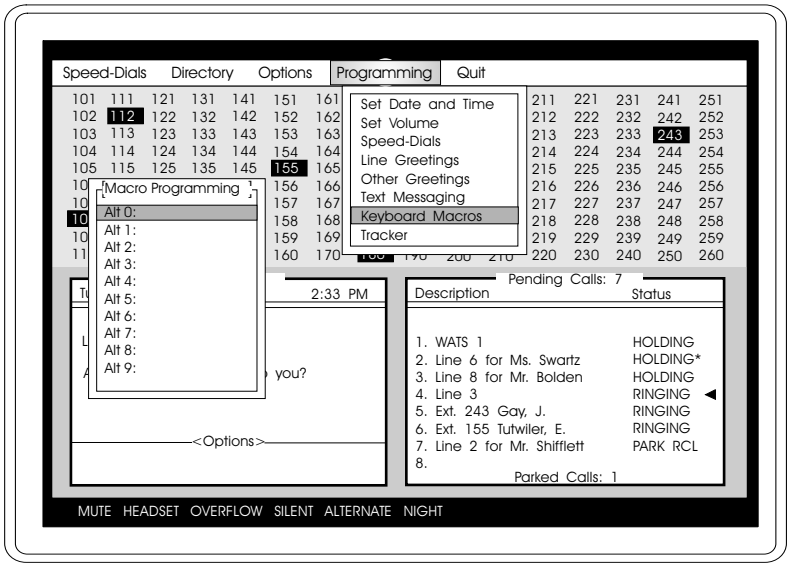
NOTE: You can give the macro a name by highlighting it and entering a name from the keyboard. You can use all string editing keys (backspace, insert, delete, for example).

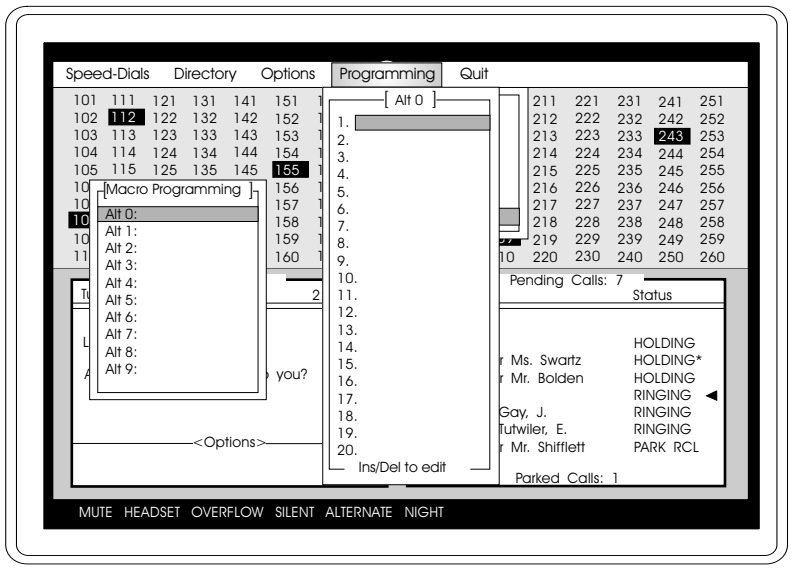
7. from the macro editing window, highlight the macro you want to edit,
8. press **Enter**,
9. use the up and down arrow keys to highlight an entry,
10. press insert to add a new event,

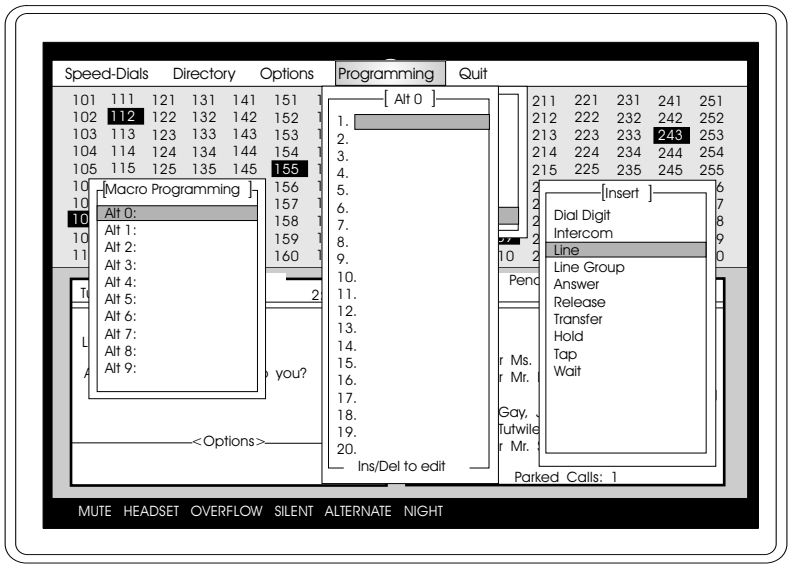
    —OR—

    press delete to remove an entry,
11. from the Insert window, highlight the event you wish to insert (If the selected event requires extra information, a field will appear at the bottom of the window to enter that information.).

ILLUS10K


Speed-Dials
Directory
Options
Programming
Quit
Set Date and Time
Set Volume
Speed-Dials
Line Greetings
Other Greetings
Text Messaging
Keyboard Macros
Tracker
[Macro Programming]
Alt 0:
Alt 1:
Alt 2:
Alt 3:
Alt 4:
Alt 5:
Alt 6:
Alt 7:
Alt 8:
Alt 9:
2:33 PM
you?
<Options>
Pending Calls: 7
Description
Status
1. WATS 1 HOLDING
2. Line 6 for Ms. Swartz HOLDING*
3. Line 8 for Mr. Bolden HOLDING
4. Line 3 RINGING
5. Ext. 243 Gay, J. RINGING
6. Ext. 155 Tutwiler, E. RINGING
7. Line 2 for Mr. Shifflett PARK RCL
8.
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT


Speed-Dials
Directory
Options
Programming
Quit
[Alt 0]
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
Ins/Del to edit
[Macro Programming]
Alt 0:
Alt 1:
Alt 2:
Alt 3:
Alt 4:
Alt 5:
Alt 6:
Alt 7:
Alt 8:
Alt 9:
you?
<Options>
Pending Calls: 7
Status
HOLDING
r Ms. Swartz HOLDING*
r Mr. Bolden HOLDING
RINGING
Gay, J. RINGING
Tutwiler, E. RINGING
r Mr. Shifflett PARK RCL
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT


Speed-Dials
Directory
Options
Programming
Quit
[Alt 0]
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
Ins/Del to edit
[Macro Programming]
Alt 0:
Alt 1:
Alt 2:
Alt 3:
Alt 4:
Alt 5:
Alt 6:
Alt 7:
Alt 8:
Alt 9:
[Insert]
Dial Digit
Intercom
Line
Line Group
Answer
Release
Transfer
Hold
Tap
Wait
you?
<Options>
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT

2.8.8 Enabling The Tracker Paging System

Before you can use the *Tracker* paging system, you must first enable the paging feature. You can enable the paging feature in either the *local* mode or the *system* mode. In either mode, you can create and send up to eight default messages (*see* 2.8.9).

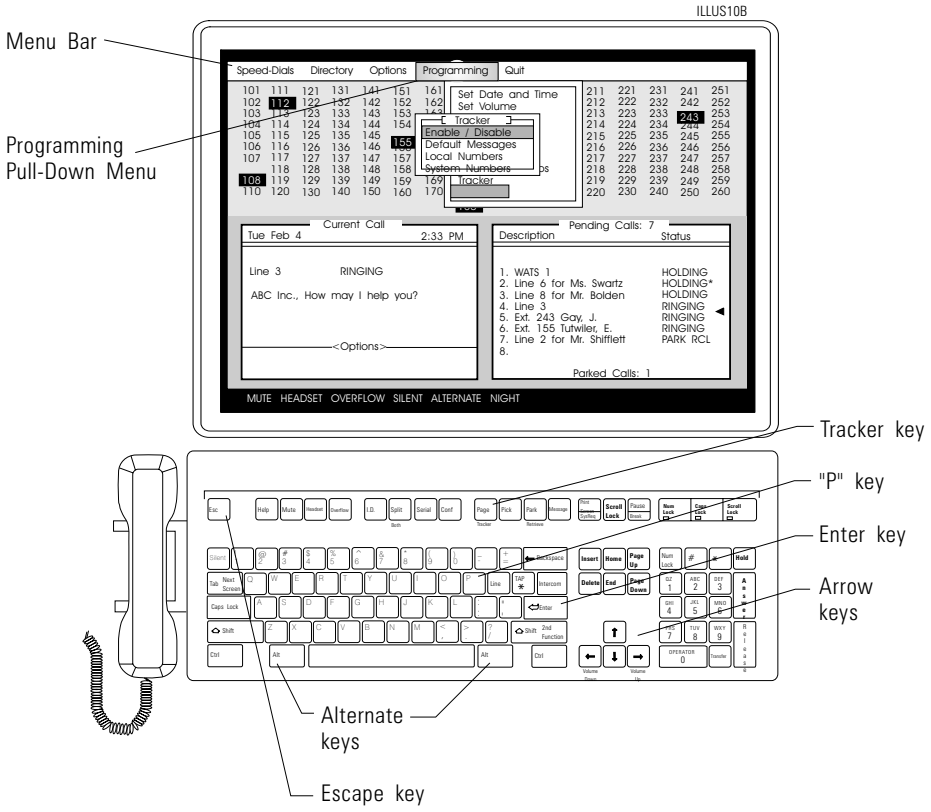
In the *local* mode, you will be able to make your own intercom-pager assignments. These assignments will not change any assignments previously programmed into the DXP system by the installer or system programmer. To use the local mode, you must also have the Tracker base station plugged into the PC Attendant Console at the port designated on your Tracker Status pull-down menu.

When using the *system* mode, Tracker selections are identical to those programmed in the *DXP* system by the installer or system programmer and any changes made in the system will be sent automatically to the *DXP*. In this mode, you must also make sure that the installer or system programmer programs the *DXP* system for *remote installation* (if Tracker has been installed on the PC).

- *To enable Tracker,*
  1. activate the Programming pull-down menu,
  2. press **ALT-P** and press **Enter**,

     —OR—

     press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,
  3. move the cursor to highlight "Tracker Options,"
  4. press **Enter**,
  5. move the cursor to highlight "Disable/Enable Local/ Enable System,"
  6. press **Enter**,
  7. move the cursor to highlight the appropriate choice and press **Enter**.



2.8.9 Programming The Tracker Default Messages

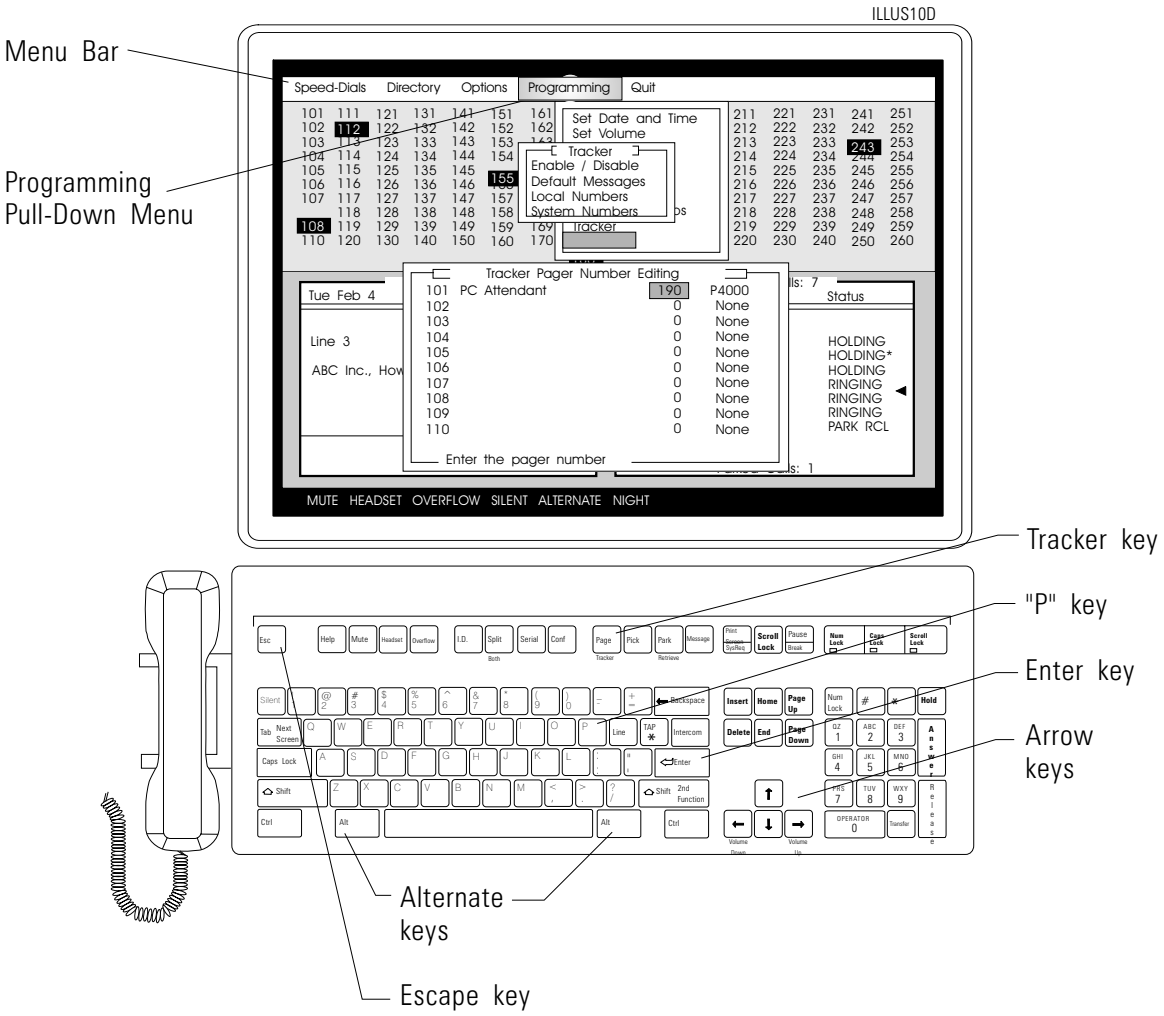
You can set a maximum of eight defaulted messages. Each defaulted message can contain a maximum of 32 characters (any printable characters); however, some pagers only accept 20-character messages and others only accept numeric pages.

NOTE: To use the Tracker pager, you must enable the Tracker base unit first (2.8.8).

- *To program default messages,*
  1. activate the Programming pull-down menu,
  2. press **ALT-P** and press **Enter**,

     —OR—

     press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,
  3. move the cursor to highlight "Tracker,"
  4. press **Enter**,
  5. move the cursor to highlight "Default Messages,"
  6. press **Enter**,
  7. type or edit the default message(s),
  8. move the cursor to highlight "Save changes as new defaults" and press **Enter**.



2.8.10 Programming The Tracker Pager Numbers

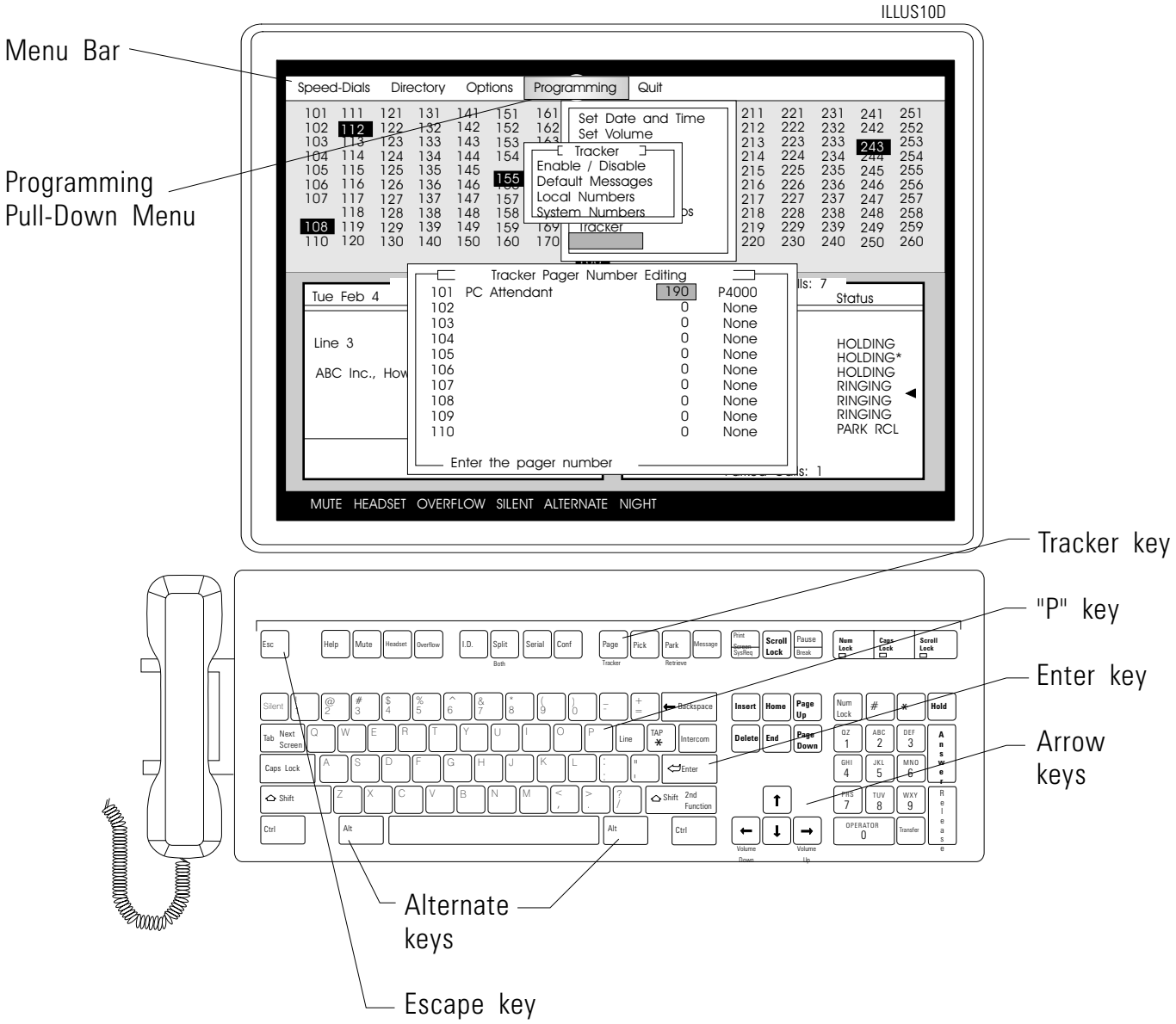
Assign a pager number to the specific *DXP* station number. You can assign a pager number to an unused extension number so that the user can be paged even if he or she doesn't have a station. All extensions default to pager number 0 and no pager type.

NOTE: To use the Tracker pager, you must enable the Tracker base unit first (2.8.8).

- *To program a pager number,*

1. activate the Programming pull-down menu,
2. press **ALT-P** and press **Enter**,

   —OR—
   press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Programming," and press **Enter**,
3. move the cursor to highlight "Tracker,"
4. press **Enter**,
5. move the cursor to highlight "Pager Numbers,"
6. press **Enter**,
7. highlight the line of the desired DXP extension (all currently defined *DXP* extensions appear),
8. enter the pager number,
9. press **Enter**,
10. enter the pager type (scroll between pager types using the space bar),
11. press **Shift** key and the **Tab** key together to move to the next line or press **Esc** to exit.


ILLUS10D
Menu Bar
Programming Pull-Down Menu
Speed-Dials
Directory
Options
Programming
Quit
Set Date and Time
Set Volume
Tracker
Enable / Disable
Default Messages
Local Numbers
System Numbers
Tracker
Tracker Pager Number Editing
101 PC Attendant 190 P4000
Enter the pager number
Tue Feb 4
Line 3
Status
HOLDING
HOLDING*
HOLDING
RINGING
RINGING
RINGING
PARK RCL
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT
Tracker key
"P" key
Enter key
Arrow keys
Alternate keys
Escape key

3 Using Specialized Features

3.1 Both *Feature*

Often, a caller will need to hold while you locate an individual. Once the person is connected to the PC Attendant console, you can use the **Both** key to establish a conference among the PC Attendant console, the last call placed on hold, and the current call.

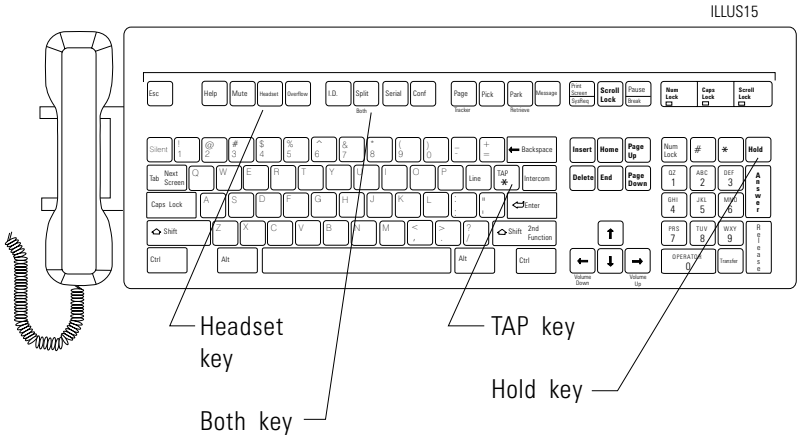
- *To use the both feature, while on current call, press* **Shift/2nd Function** *and* **Split** *simultaneously. The last call placed on hold is then part of the established three-way conference.*
- *To place both parties on hold at the Attendant PC, press* **Hold** *(the calls are now in Conference Hold).*
- *To return both parties to the three-way conference, press* **Tap**.
- *To allow the two parties to continue talking in an unsupervised conference, press # to drop out of the three-way call.*

3.2 Headset

If your console is equipped with an optional headset for handset–free operation, you will need to "tell" the system when you switch between the handset and headset modes.

NOTE: Your headset must be plugged in for this feature to activate.

- *To switch from handset to headset, press* **Headset**. *The Headset indicator at the bottom of your main screen will be highlighted.*
- *To return to the handset mode, press* **Headset**. *The Headset indicator will dim.*



3.3 I.D.

A busy PC Attendant console can receive and direct many calls in a very short period of time. Some of the calls that are transferred or placed on hold will recall to the PC Attendant console after a period of time if they are not answered. To help you remember an aspect of a call that recalls to your station (such as who the call was originally for or why a person was holding), we've included an I.D. feature at the PC Attendant station that lets you "tag" a call with a name or a phrase up to 14 characters long.

- *To add a tag to a call,*
  1. while on the call, press **ID**,
  2. type the call's tag in the I.D. window,
  3. press **Enter**. The tag will remain with the call until the call is disconnected from the system.

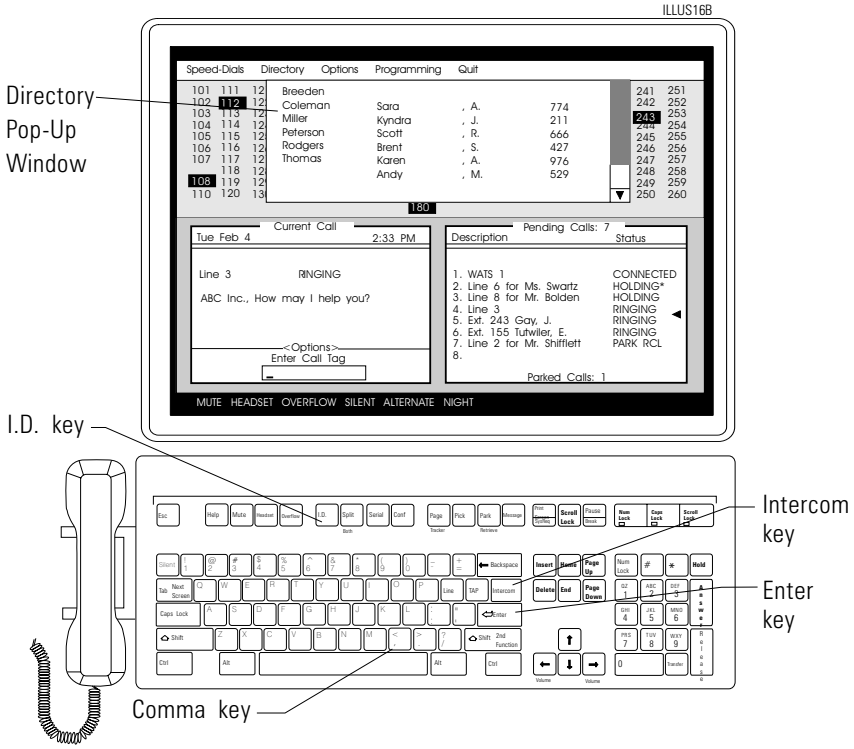
3.4 Intercom

You can choose to dial a person's intercom by typing his or her name instead of looking up the correct intercom number and then dialing the call.

- *To use the dial-by-name feature,*
  1. press **Intercom**,
  2. type the first letter of the person's last name,

     —OR—

     press the comma (,) key and then type the first letter of the person's first name; type additional letters of the person's name as needed until the cursor is positioned on the desired name, or use the arrow keys to position the cursor on the name,
  3. when the directory window appears, position the cursor on the desired name,
  4. press **Enter**. Your call will ring at the desired station,
  5. If you know the intercom number, press **Intercom** and dial the number from the dial pad. The called station will ring.



3.5 Message

3.5.1 Message Waiting Indicator

- **To activate a message-waiting indicator at any station,**

  1. **position cursor on intercom number to receive indicator setting,**
  2. **press Message** key,
  3. move the cursor to "Set/Clear Callback Msg,"
  4. press **Enter**. The light above or next to the **HOLD** button will flutter at the selected station.

- *To turn off a message-waiting indicator at the called station, repeat above procedure.*

- *If you call a station and hear a busy signal or receive no answer,*

  1. while on call, move cursor to **MESSAGE** under Options in the Current Call window,
  2. press **Enter**. Message-waiting light will flutter at called station.

- *To turn off the message-waiting light at the called station, repeat above procedure.*

NOTE: A message-waiting light can also be turned on at another station through the Intercom Status window. Simply activate the window by moving the cursor to the desired intercom on the screen and press Enter. When the Intercom Status window appears, move the cursor to "MESSAGE" and press Enter. When the message pop-up window appears, move the cursor down to "Set/Clear Callback Msg" and press Enter. The message-waiting indicator is set at that station. Turn off the message indicator by repeating these steps.

3.5.2 Text Messages

The PC Attendant's **Message** key, in addition to turning on a message-waiting light at a station, will allow you to access a "message" pop-up window to store a text message for any station.

The message can take the form of a "canned" message set by the system (e.g. "Please call," "Will call again," "Wants to see you") or a customized message (up to 8, 32-character lines for a total of 256 characters). Storing a text message for an extension automatically turns on the fluttering message-waiting indicator above the hold button at that station (if auto-message set is enabled by the attendant and text messaging keys are not programmed at individual stations).

System users can retrieve text messages in one of three ways:

- *LCD telephone users can cause the messages to appear in their telephone's display, line by line;*
- *all station users can retrieve messages at a system printer that, if enabled through class of service programming, can be made to print out all text messages as they are stored or to print selected text messages on command;*
- *non-LCD and single-line telephone users can call the attendant, who can retrieve and read the messages stored for any extension.*
- *To store a text message for any station,*

1. position the cursor on the desired extension number in the intercom window,
2. press the **Message** key (the message pop-up menu appears on the screen),
3. move cursor (if necessary) to select "Take Text Message" option,
4. press **Enter** (the "Take Text Message" pop-up window appears on the screen),
5. use the up and down arrow keys to move the cursor to desired fields within the window,
6. within each field, type appropriate message information,
7. within the preset message field, use the space bar to set the proper indicators next to as many preset messages as desired,
8. press **Enter** to move cursor into Message field/box,
9. type desired message (up to 256 characters),
10. press **Enter** to move the cursor into the Options field,
11. using the right and left arrow keys, move the cursor to the appropriate option,
12. press **Enter**.

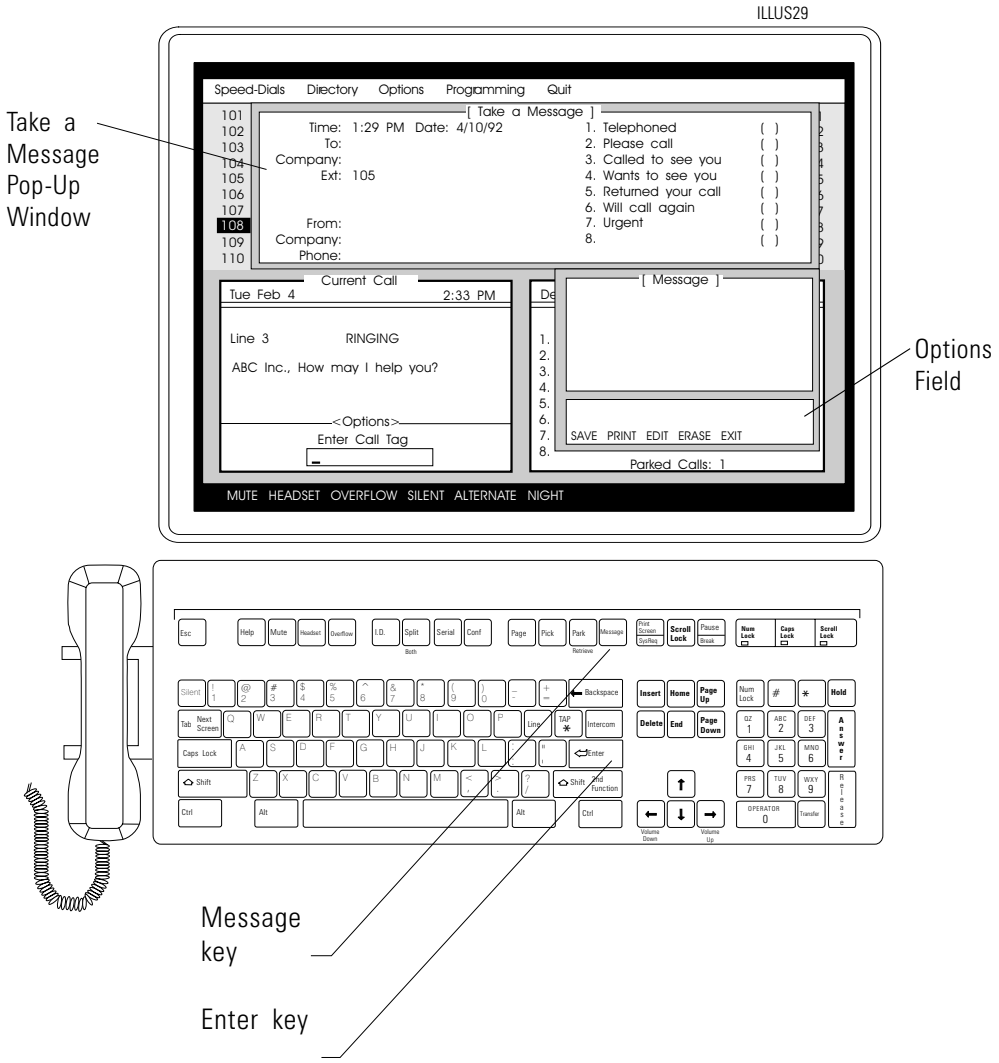
— If you choose **SAVE**, the system saves the current message for the selected station. If you repeat the procedure with another message for the same extension, the system would save that message as message 2 (up to 100 messages per station or until disk is full).

— If you choose **PRINT**, the message will automatically be sent to the printer and be printed. When a message is printed, a "Message taken by" field prints at the end of the message, indicating the extension of the attendant station taking the message. You may type in the message, choose **PRINT**, and then exit without saving the message in order to conserve disk space.

— If you choose **EDIT**, the cursor would move to the beginning of the Take a Message window and allow you to change any part of the message you've entered. Selecting **SAVE** after you've edited the message will save the edited version of the message. (Once you have saved a message, however, you cannot edit it.)

— If you choose **ERASE**, the message you are viewing is erased from the system and disappears from the window.

— If you choose **EXIT**, the message you've entered will not be saved and the text message pop-up menu will reappear.

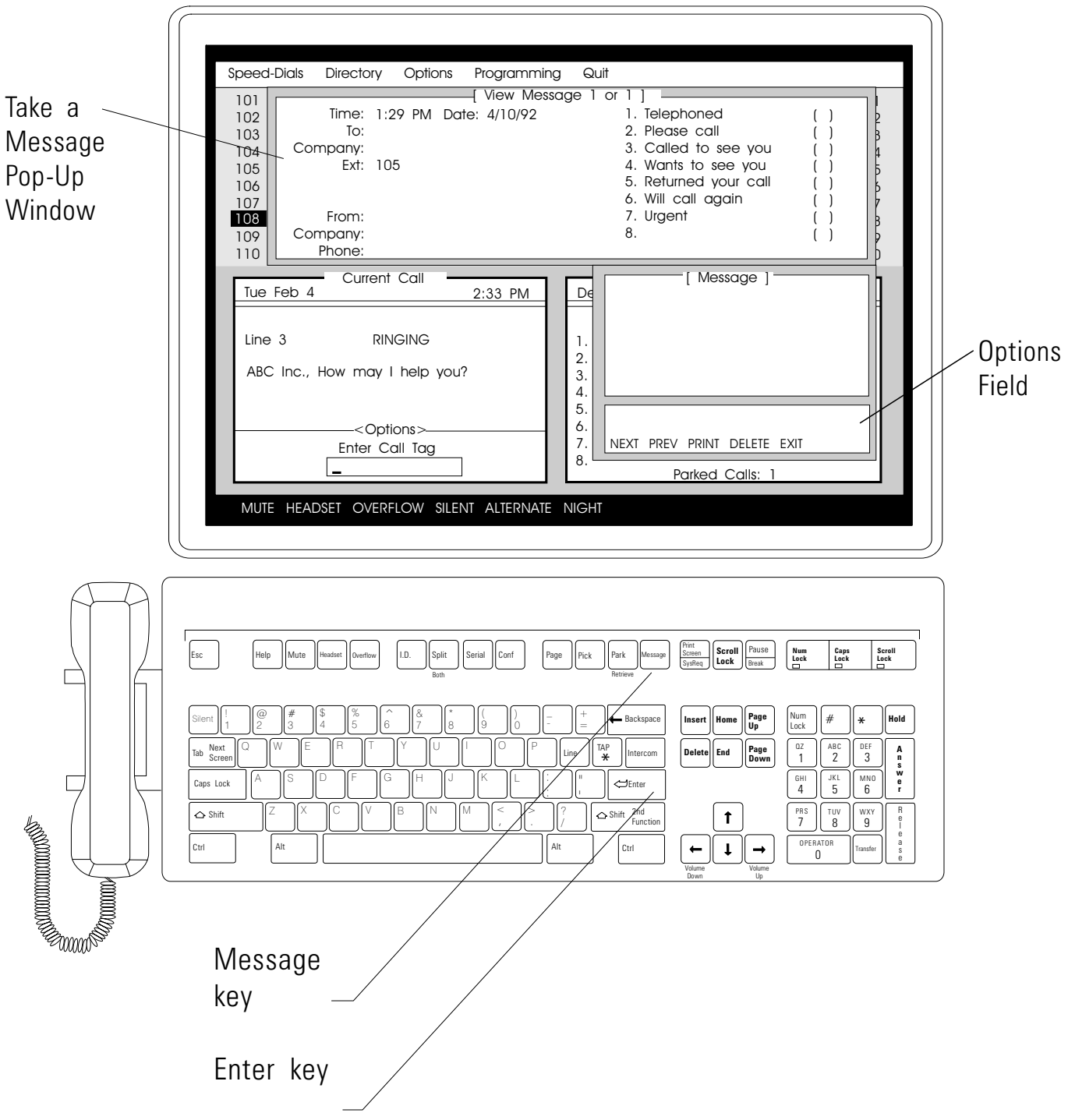


3.5.3 Viewing A Text Message (at the PC Attendant)

The attendant may view all of the current messages for any station at any time.

- *To view text messages for an extension,*
  1. position the cursor on the desired extension number in the intercom window (if you are not currently connected to that extension),
  2. press **Message** key (the message pop-up menu will appear),
  3. move the cursor to select "View Text Message" (this menu option will not be accessible if no message is saved for that extension),
  4. press **Enter**. The first saved message appears on the screen (the field "Message X of Y" indicates the number of the message you are viewing and the total number of messages saved for that station).
- *To view subsequent messages,*
  1. move the cursor to the Options field,
  2. select **NEXT**,
  3. press **Enter**. The second saved message will appear on the screen. Repeat the procedure to scroll forward through all messages saved for that extension.
- *To review previous messages, press* **PREV**. *The previously viewed message will reappear. Repeat the procedure to scroll backward through all messages saved for that extension.*
- *To print the message you are currently viewing,*
  1. move the cursor to the Options field,
  2. select **PRINT**,
  3. press **Enter.** The message is printed and remains saved until it is deleted.
- *To delete a message you are currently viewing,*
  1. move the cursor to the Options field,
  2. select **DELETE**,
  3. press **Enter.** The message is deleted from the system.

ILLUS29A


Take a Message Pop-Up Window
Options Field
Message key
Enter key
Speed-Dials
Directory
Options
Programming
Quit
[View Message 1 or 1]
Time: 1:29 PM Date: 4/10/92
To:
Company:
Ext: 105
From:
Company:
Phone:
1. Telephoned ( )
2. Please call ( )
3. Called to see you ( )
4. Wants to see you ( )
5. Returned your call ( )
6. Will call again ( )
7. Urgent ( )
8. ( )
Current Call
Tue Feb 4 2:33 PM
Line 3 RINGING
ABC Inc., How may I help you?
<Options>
Enter Call Tag
[Message]
NEXT PREV PRINT DELETE EXIT
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT

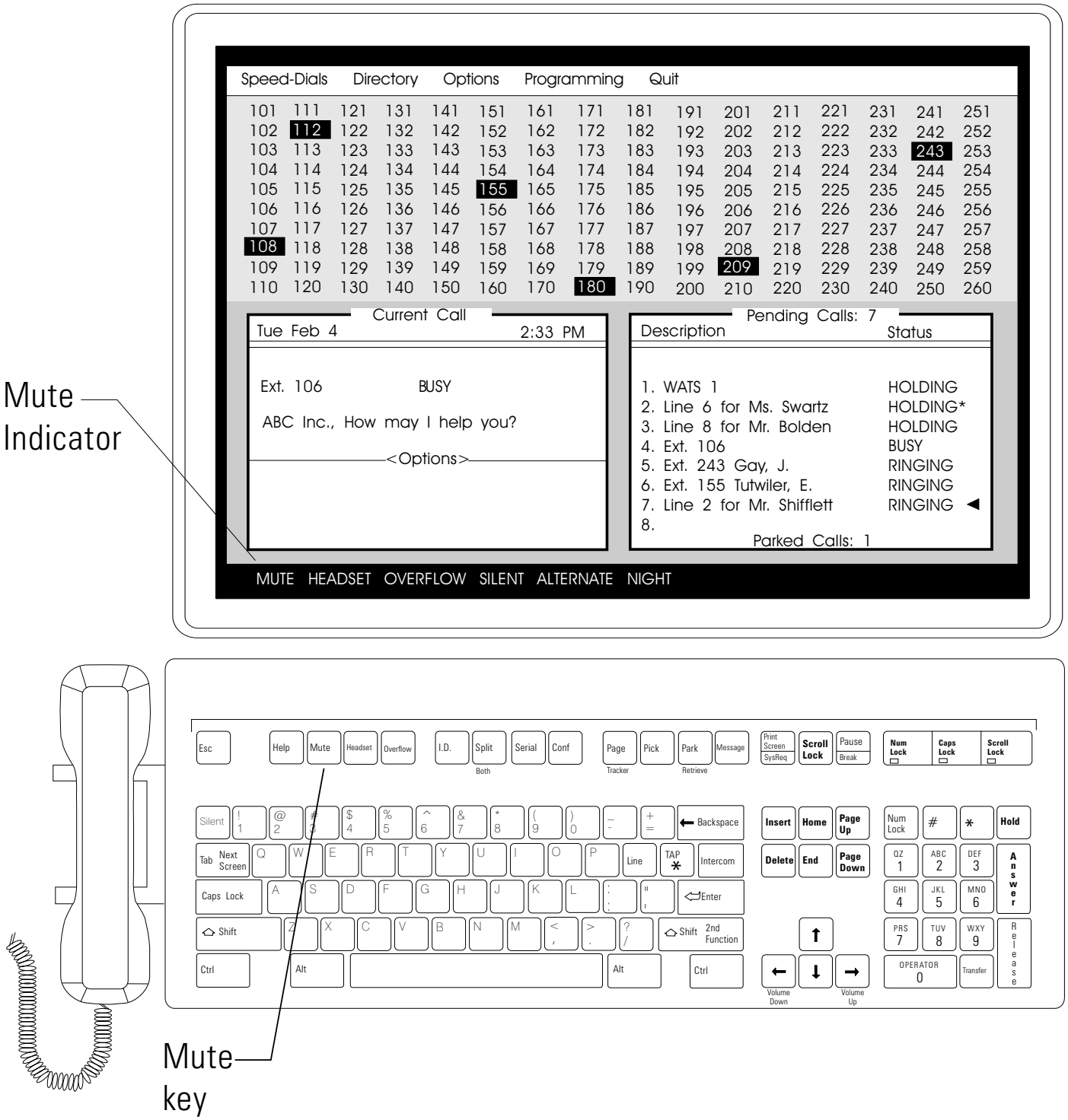
3.6 Mute

By using the Mute feature, you can block transmission of your voice to the distant party.

- *For example, if someone comes into your office to talk to you and you do not want to interrupt the distant party, press* **Mute** *(Mute feature is highlighted in the features bar at the bottom of your main screen).*

- *To cancel the Mute feature and return to your conversation with the distant party, press* **Mute** *to disengage the feature.*

ILLUS17A


Speed-Dials
Directory
Options
Programming
Quit
Current Call
Tue Feb 4
2:33 PM
Ext. 106
BUSY
ABC Inc., How may I help you?
<Options>
Pending Calls: 7
Description
Status
1. WATS 1
HOLDING
2. Line 6 for Ms. Swartz
HOLDING*
3. Line 8 for Mr. Bolden
HOLDING
4. Ext. 106
BUSY
5. Ext. 243 Gay, J.
RINGING
6. Ext. 155 Tutwiler, E.
RINGING
7. Line 2 for Mr. Shifflett
RINGING
8.
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT
Mute Indicator
Mute key

3.7 Overflow

Peak calling periods can make it harder for a single attendant to handle every call that needs service. You can cause all incoming calls to ring at an overflow attendant's station *and* at your station. The calls will still be queued in the system according to their priority, and calls will recall to the attendant's station where they were originally answered.

- *To share incoming calls with an overflow attendant, press* **Overflow**. *The "Overflow" indicator at the bottom of the main screen will be highlighted.*

- *To return the ringing of all incoming calls to the PC Attendant console, press* **Overflow**. *The "Overflow" indicator at the bottom of the main screen will dim.*

3.8 Page

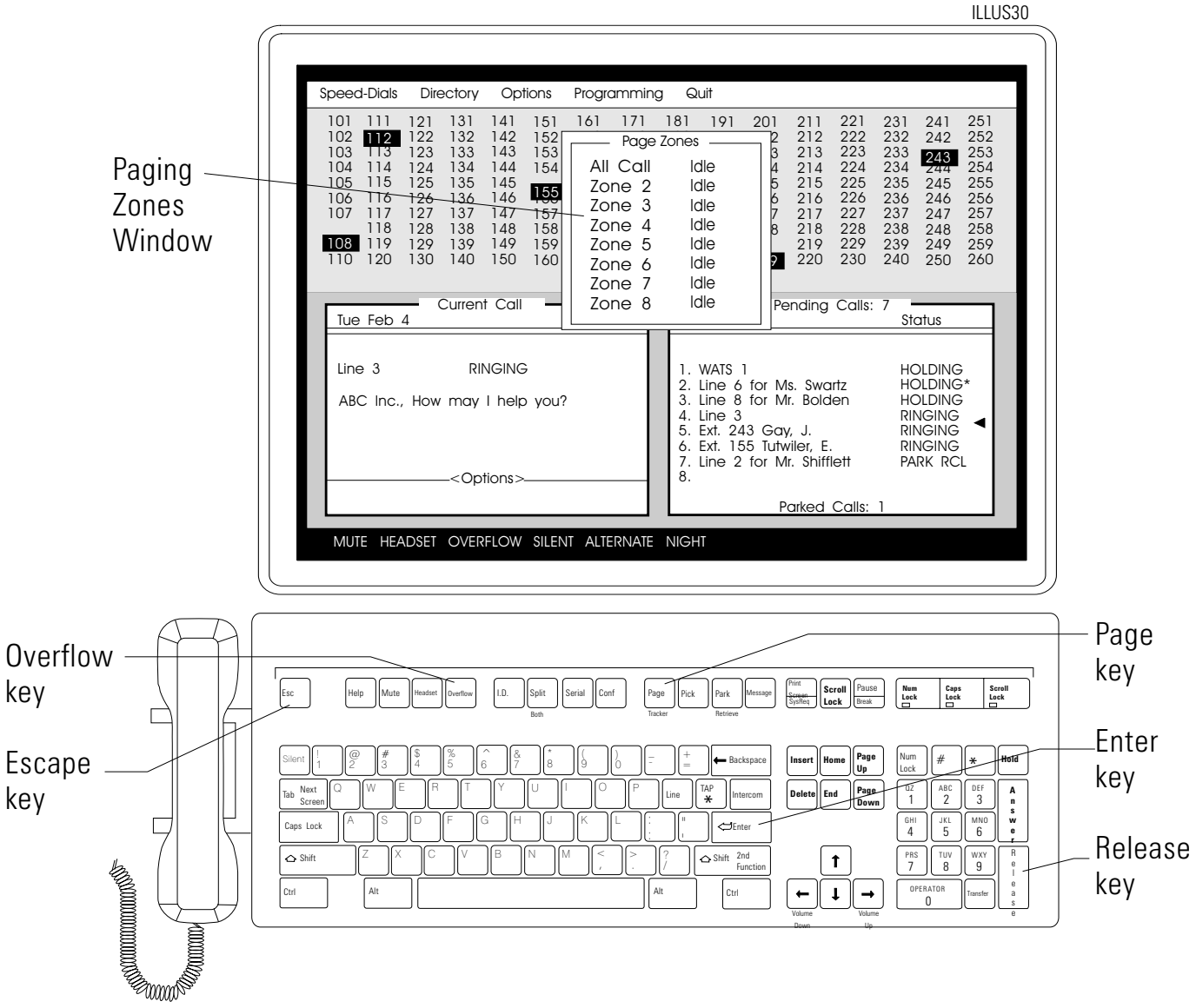
It may be necessary for you to make a paging announcement in a particular zone (e.g. throughout one department or in a warehouse) or in all zones of your location (known as all-call paging).

- *To make a paging announcement from the PC Attendant console to a particular zone,*

  1. press **Page** to activate Paging pop-up window,
  2. move the cursor to choose the zone in which your page will be heard (Zone 1 typically is designated by the system as the all-call paging zone),
  3. press **Enter**,
  4. make announcement,
  5. press **Esc** to exit the paging feature,
  6. press **Release** to disconnect from the paging zone.

NOTE: To make a paging announcement in more than a single zone but not in the all-call mode, you will need to make a separate paging announcement in each of those zones, one at a time. After you complete a page in one zone, move cursor to highlight another zone and repeat the announcement.

ILLUS30


Paging Zones Window
Overflow key
Escape key
Page key
Enter key
Release key
Speed-Dials
Directory
Options
Programming
Quit
Page Zones
All Call Idle
Zone 2 Idle
Zone 3 Idle
Zone 4 Idle
Zone 5 Idle
Zone 6 Idle
Zone 7 Idle
Zone 8 Idle
Current Call
Tue Feb 4
Line 3 RINGING
ABC Inc., How may I help you?
<Options>
Pending Calls: 7
Status
1. WATS 1 HOLDING
2. Line 6 for Ms. Swartz HOLDING*
3. Line 8 for Mr. Bolden HOLDING
4. Line 3 RINGING
5. Ext. 243 Gay, J. RINGING
6. Ext. 155 Tutwiler, E. RINGING
7. Line 2 for Mr. Shifflett PARK RCL
8.
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT

3.9 Pick

You may pick up any call that is ringing at another telephone in your system.

- *To pick up a call,*
  1. press **Pick**,
  2. dial number of ringing station (you will then be connected to that call).

(Performing a Direct Station Selection [DSS] on a ringing station will also allow you to pick up a call.)

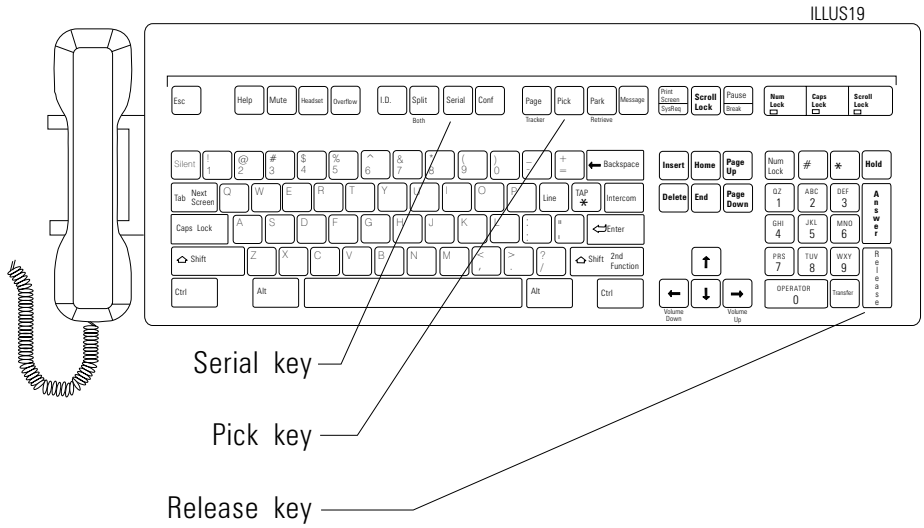
3.10 Serial

Sometimes a current call will need to be transferred to more than one intercom in a particular sequence (this is called a serial transfer).

- *To complete a serial transfer,*
  1. while on the call, press **Serial** (call is placed on hold automatically),
  2. dial intercom to receive transfer,
  3. dial intercom to receive second transfer,
  4. repeat once more to place a third intercom in the serial,
  5. press **Release**. Transferred call will connect to first transfer in the serial.

When the call is disconnected from the first intercom in the serial, the system will automatically send it to the second intercom number, etc., until final transfer is complete. The call disconnects from the system when the final transfer is disconnected.

At any time during a serial transfer, an intercom party may discontinue the serial by redirecting the call.



3.11 Silent

A busy Attendant's console will ring often with incoming calls, sometimes during an active call. This constant ringing can be irritating to both you and the person with whom you are speaking.

- *To silence the ringer at the PC Attendant console for the duration of the currently ringing call, press* **Silent**. *The ringer will remain silent until the next call rings at the PC Attendant console.*

3.12 Split

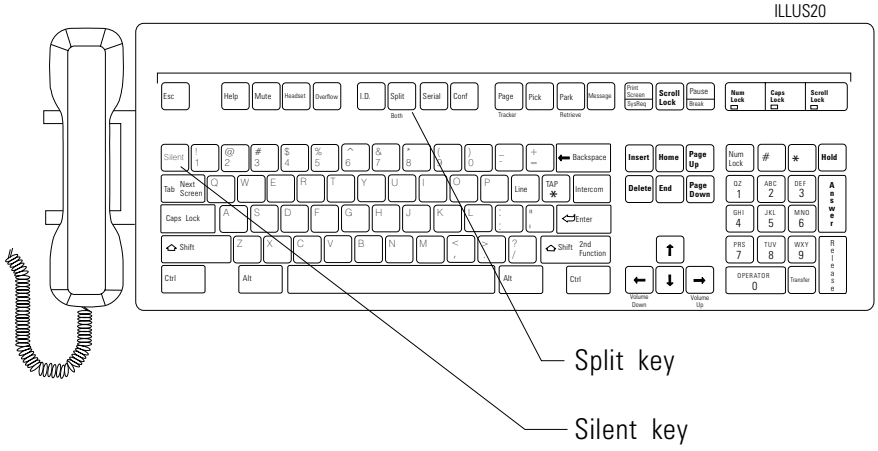
You can alternately connect the PC Attendant console to the last call placed on hold and a current call.

- *To use the split feature, while on a call, press* **Split** *(the current call is placed on hold, and the last call placed on hold is retrieved).*

- *To alternate the calls again, press* **Split**.

You may go between the two calls in this manner for as long as you'd like, and you may handle them separately at any time (transferring the current call, for example, releases that call from the PC Attendant console and leaves the held call on Hold).

Or you may want to establish a conference between these two calls using the Both key (see discussion on page 25 of this guide).



3.13 Alternate

Calls that normally ring at the PC Attendant console can be directed to an alternate attendant's station (the alternate station need not be a PC Attendant station).

- *To transfer all call activity to an alternate attendant,*

  1. activate the Options menu,

  2. press **ALT-O** and press **Enter**,

     —OR—

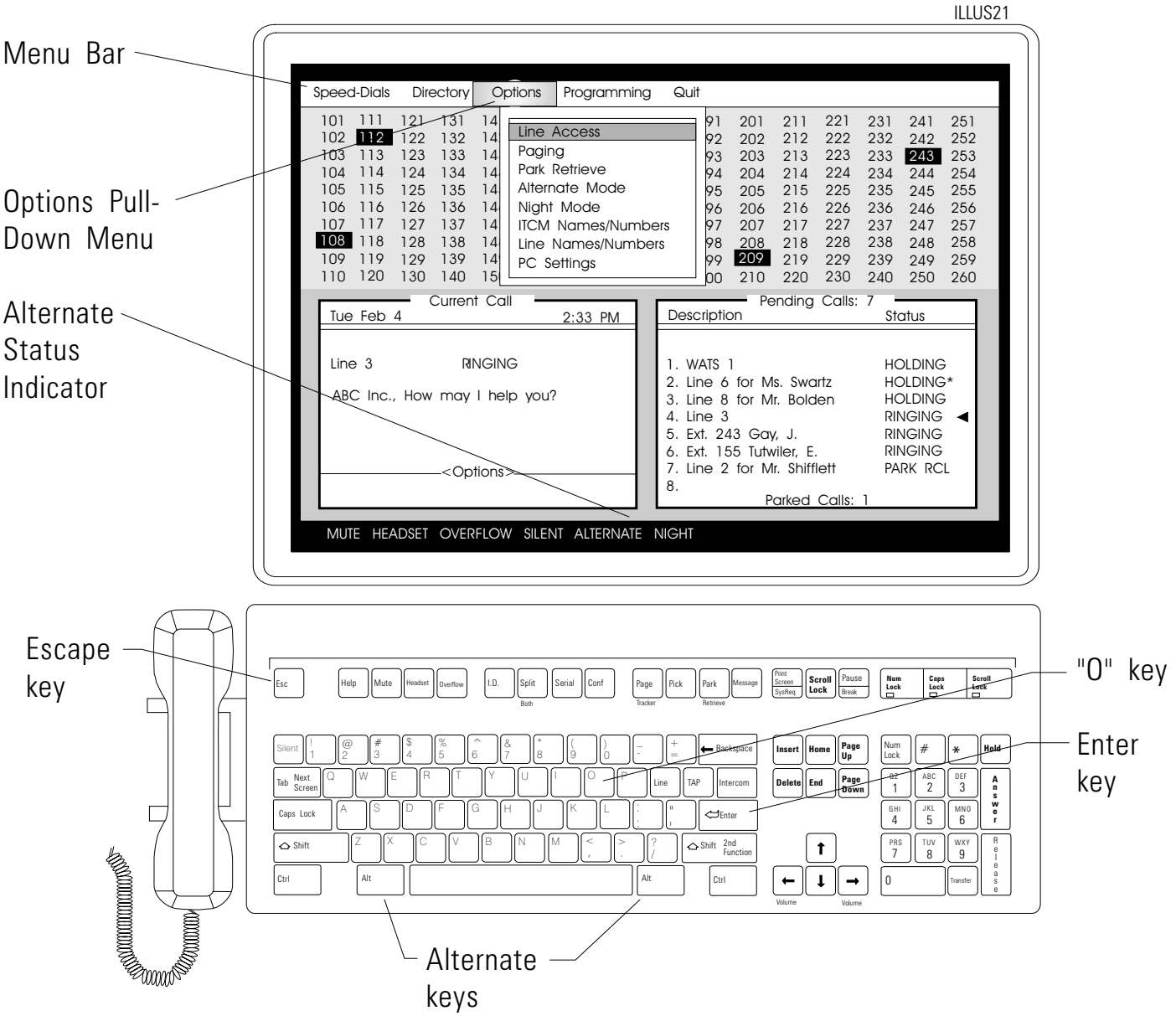
     press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Options," and press **Enter**,

  3. move the cursor to highlight "Alternate,"

  4. press **Enter**. Calls will ring at the alternate station.

- *To return call activity to the PC Attendant console from the alternate attendant, repeat the above procedure.*

The Alternate status indicator at the bottom of the main screen will be highlighted when the alternate mode is activated.


ILLUS21
Menu Bar
Options Pull-Down Menu
Alternate Status Indicator
Speed-Dials
Directory
Options
Programming
Quit
Line Access
Paging
Park Retrieve
Alternate Mode
Night Mode
ITCM Names/Numbers
Line Names/Numbers
PC Settings
Current Call
Tue Feb 4
2:33 PM
Line 3
RINGING
ABC Inc., How may I help you?
<Options>
Pending Calls: 7
Description
Status
1. WATS 1 HOLDING
2. Line 6 for Ms. Swartz HOLDING*
3. Line 8 for Mr. Bolden HOLDING
4. Line 3 RINGING
5. Ext. 243 Gay, J. RINGING
6. Ext. 155 Tutwiler, E. RINGING
7. Line 2 for Mr. Shifflett PARK RCL
8.
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT
Escape key
"0" key
Enter key
Alternate keys

3.14 Directory

You have the ability to create a directory of the station names within your system so that you may, for example, use the dial-by-name feature (see section titled “Intercom—Using The Intercom Key To Dial By Name Or Dial By Number” in this chapter).

For your own purposes, it is convenient to have a complete and up-to-date list of all intercom numbers and their user’s names appear on your PC Attendant’s screen with the touch of a button.

Before you create such a directory, it is a good idea to obtain a list of names and numbers as they were programmed by the installer of your DXP system (these names appear in your Intercom window when you switch the display from numbers to names) to avoid confusion between what names appear in the Intercom window and what names appear in the Directory you create.

To create a directory of names and numbers for your system,

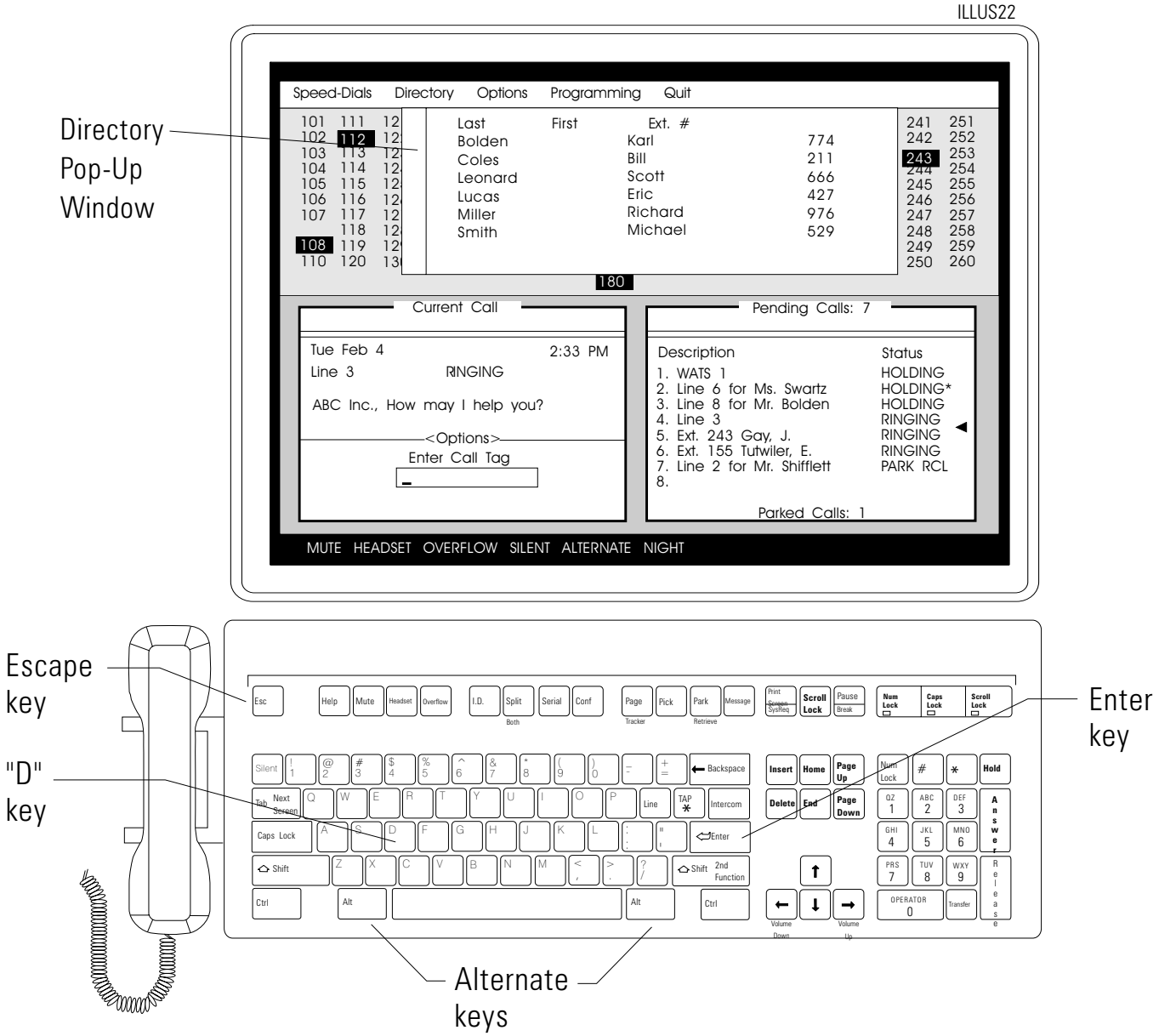
1. activate the Directory pull-down menu,
2. press **ALT-D** and press **Enter**,

   —OR—

   press **Esc** to move the cursor into the menu bar, use the arrow keys to select “Directory,” and press **Enter**,
3. with the directory menu activated, press **Insert** to activate the Directory Editing window,
4. type the station user’s last name,
5. press **Enter**,
6. type the station user’s first name,
7. press **Enter**,
8. type the station user’s middle name or initial (if desired),
9. press **Enter**,
10. type the station number using the keyboard numbers,
11. press **Enter** (an empty Directory Editing window will appear so that you may continue editing the directory),
12. when you are finished creating or editing the Directory, press **Esc** (the Directory Editing window will disappear),
13. press **Esc** again to save the changes and exit the Directory.

NOTE: If you wish to name a station by its location (e.g. Board Room, Cafeteria, Hallway B, Warehouse) you may do so: simply enter the name on the line for “Last” name in the Directory Editing Window and press Enter. Press Enter twice more to move the cursor past the First and Middle name entries and then enter the extension number. Proceed according to the previous instructions in order to continue editing or save the changes.

You may view the directory at any time by pressing **ALT-D**, or by pressing **Esc**, moving the cursor to highlight "Directory," and pressing **Enter**. The Directory is arranged alphabetically and will automatically re-sort when changes are made to it.



3.15 Night

Calls that normally ring at the PC Attendant console can be directed to ring an external ringer. Night transferred calls can be answered from any telephone within the system or group.

NOTE: In order to extend the life of your monitor, turn it off whenever the PC Attendant will be relatively inactive and unattended for long periods. Do not, however, turn off the computer itself, as this will disable the operation of the console and will require you to reboot the PC Attendant.

- *To transfer incoming calls to the Night Mode,*

  1. activate the Options menu,

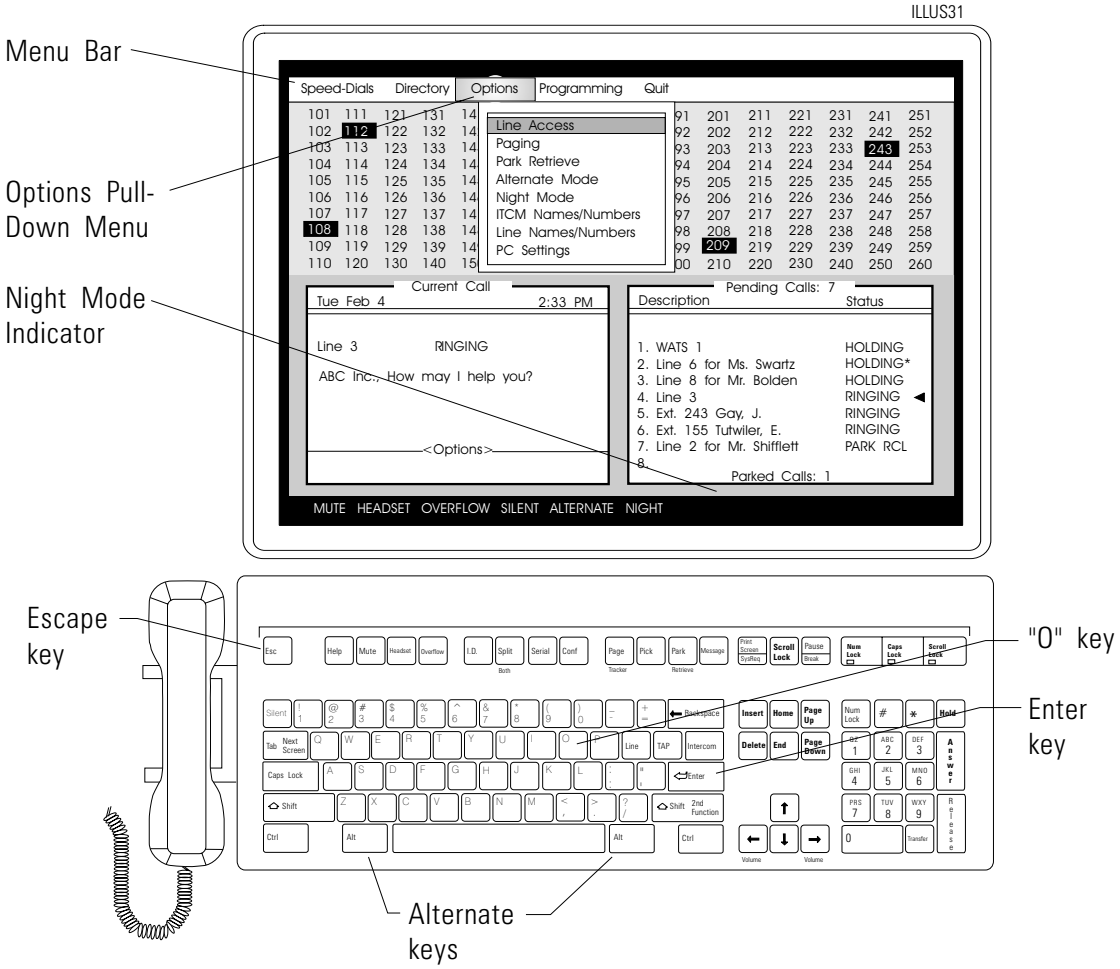
  2. press **ALT-O** and press **Enter**,

     —OR—

     press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Options," and press **Enter**,

  4. move the cursor to highlight "Night Mode,"

  5. press **Enter**. (Repeat the procedure to return service to the PC Attendant console.)



3.16 PC Settings (Screen Saver)

During periods of minimal call activity, you can activate the PC Attendant screen saver in order to keep the main screen image from becoming "burned" into the monitor over time.

When the screen saver is activated, the monitor screen (after 20 minutes of no activity at the PC Attendant console) will go dark and the "Total Control" sign will flash randomly across the screen. When activity resumes at the PC Attendant console (when a call comes in to the console or when you press any key), the main screen reappears and remains on until another 20 minutes of inactivity passes.

- *To turn the screen saver on,*

  1. activate the Options pull-down menu,

  2. press **ALT-O** and press **Enter**,

     —OR—

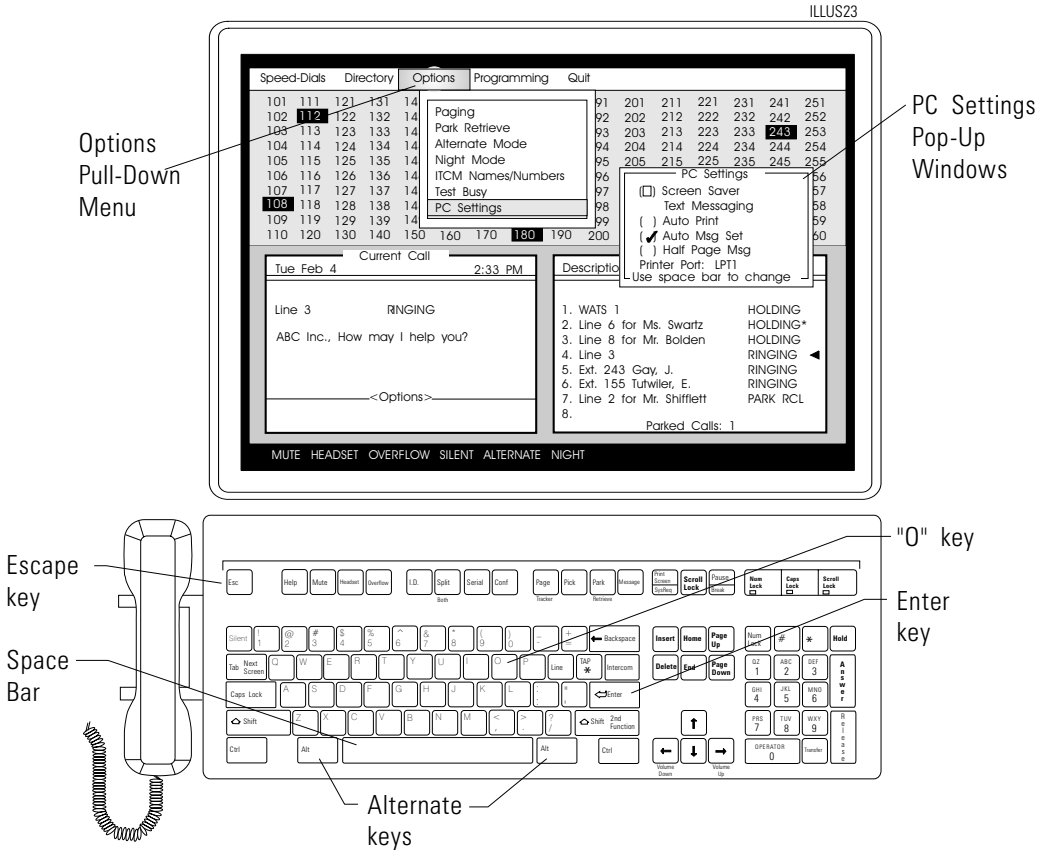
  3. press **Esc** to move the cursor into the menu bar from the main screen, position the cursor on "Options" and press **Enter,**

  4. move the cursor to "PC Settings,"

  5. press **Enter** (the PC Settings pop-up window will appear),

  6. press the **Space Bar** to activate the screen saver (a red check mark will appear in the left side of the window).

Repeat this procedure to turn off the screen saver.



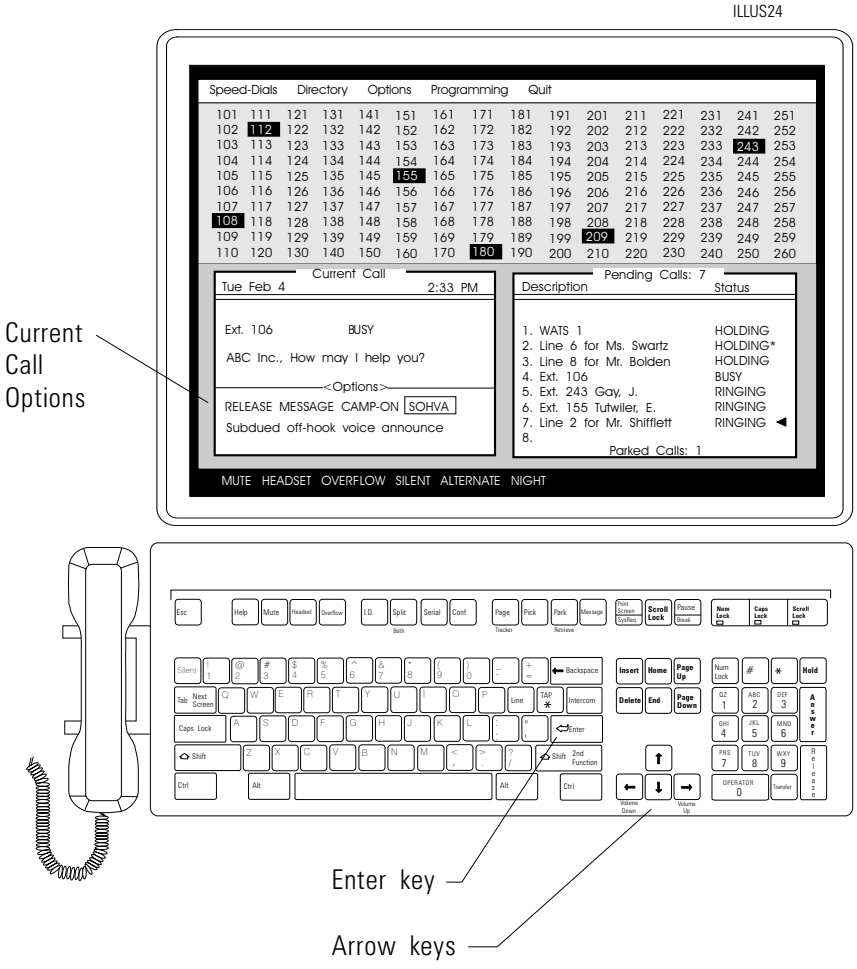
3.17 SOHVA

You can make a voice announcement to another telephone that is off-hook and busy on a call.

- *To initiate a SOHVA call,*
  1. make an intercom call to the telephone where the SOHVA is to occur,
  2. note “Busy” message for intercom number in Current Call window and hear busy tone,
  3. move the cursor to select SOHVA from the Current Call options,
  4. press **Enter** and hear one to six beeps,
  5. make announcement.

Your announcement will sound over the handset at the telephone to which you directed the SOHVA call (your voice will be heard only by the person whose station you called).

If the station you attempt to call in this manner is on-hook and busy (in the speakerphone mode) or if the station has activated a Voice-Announce Block feature, your SOHVA will not connect and you will hear a busy signal or error tone.


ILLUS24
Speed-Dials Directory Options Programming Quit
Current Call
Tue Feb 4 2:33 PM
Ext. 106 BUSY
ABC Inc., How may I help you?
<Options>
RELEASE MESSAGE CAMP-ON SOHVA
Subdued off-hook voice announce
Pending Calls: 7
Description Status
1. WATS 1 HOLDING
2. Line 6 for Ms. Swartz HOLDING*
3. Line 8 for Mr. Bolden HOLDING
4. Ext. 106 BUSY
5. Ext. 243 Gay, J. RINGING
6. Ext. 155 Tutwiler, E. RINGING
7. Line 2 for Mr. Shifflett RINGING
8.
Parked Calls: 1
MUTE HEADSET OVERFLOW SILENT ALTERNATE NIGHT
Current Call Options
Enter key
Arrow keys

3.18 Speed Dialing

System speed dials (the DXP system provides 200 such numbers, the DXP *Plus* allows for 500) allow you and other users in your system to make outside calls without dialing an entire telephone number. The Speed Dials option on the Programming pull-down menu allows you to program or edit speed dial numbers (see the discussion "System Speed-Dial Directory—Editing And Creating" in the chapter titled *Setting The System Parameters* in this guide.)

- *To make a call using a speed dial number,*

  1. activate the Speed Dials pop-up window,

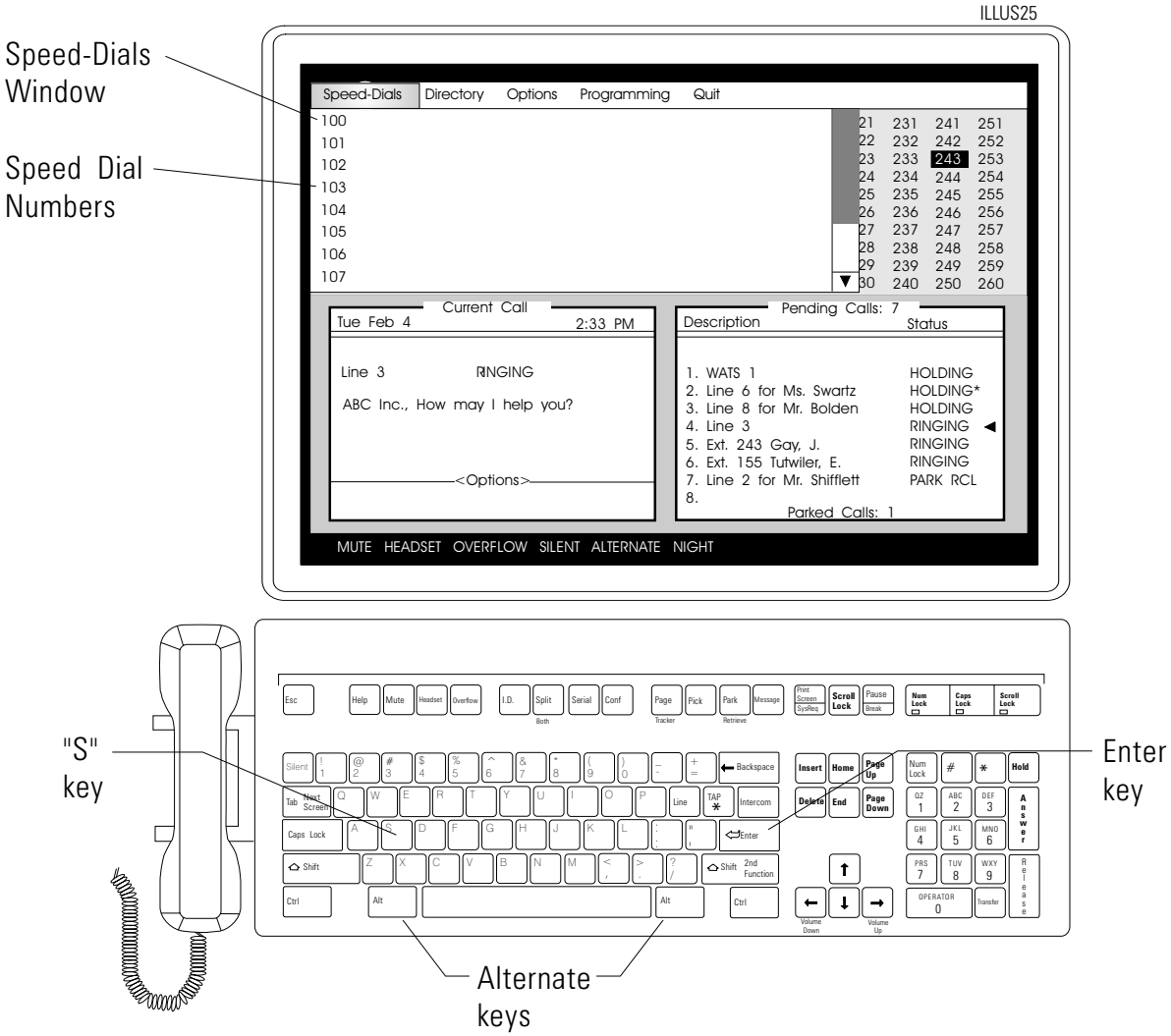
  2. press **ALT-S** and press **Enter**,

     —OR—

     press **Esc** to move the cursor from the main screen to the menu bar (the cursor will automatically highlight Speed Dials), and press **Enter**,

  3. position the cursor in the Speed Dials window on the number you wish to dial,

  4. press **Enter**. The system will then dial the number you've chosen.



4 Troubleshooting Guide

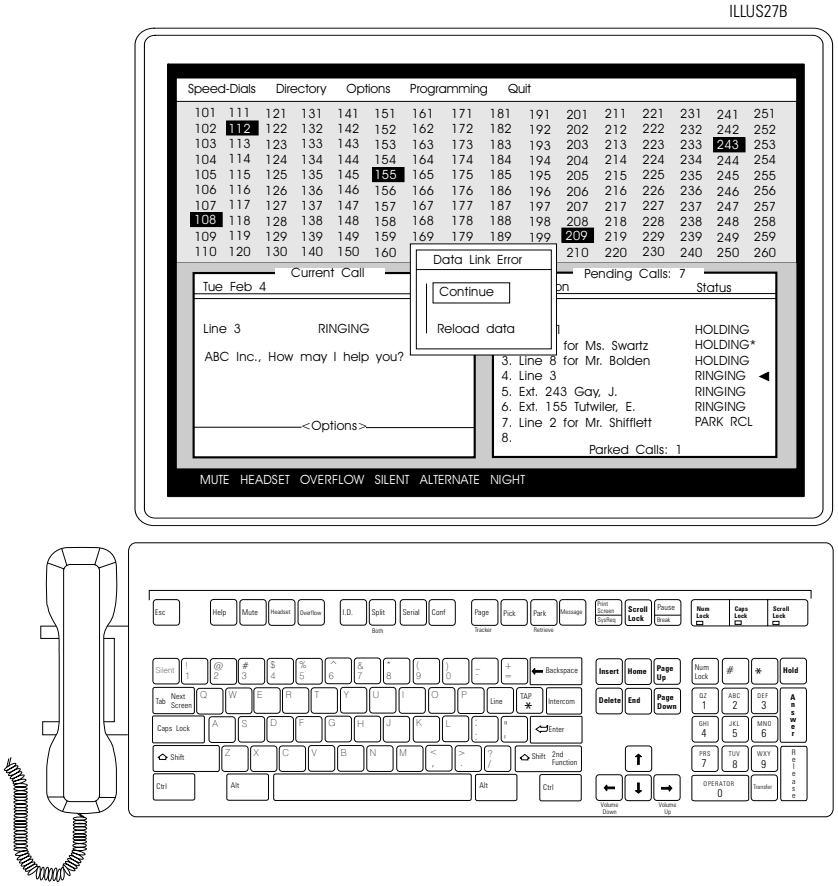
4.1 Operation Interruptions

From time to time, your PC Attendant operations may be disrupted for one reason or another: the KSX-200 system could lose communication, the system's power could temporarily fail, or the connection between the PC Attendant console and the KSX-200 system could be jarred loose. If these or other problems occur, your PC Attendant console will alert you to the status of the system in the form of screen messages (*Data Link Error* and *KSX-200 Not Responding*).

4.1.1 Data Link Error

When your KSX-200 system resets for any reason, operation of the PC Attendant console will be temporarily interrupted and the System Reset window will appear in the center of your screen. When this happens, the message "Data Link Error" will appear and the window will contain two options, "Continue" and "Reload Data." Usually, selecting the "Continue" option is sufficient to allow the PC Attendant console to continue processing calls. If there is a chance of data corruption or data change on the PC or the KSX-200 system, choose the "Reload Data" option to cause the system to resend all pertinent PC data.

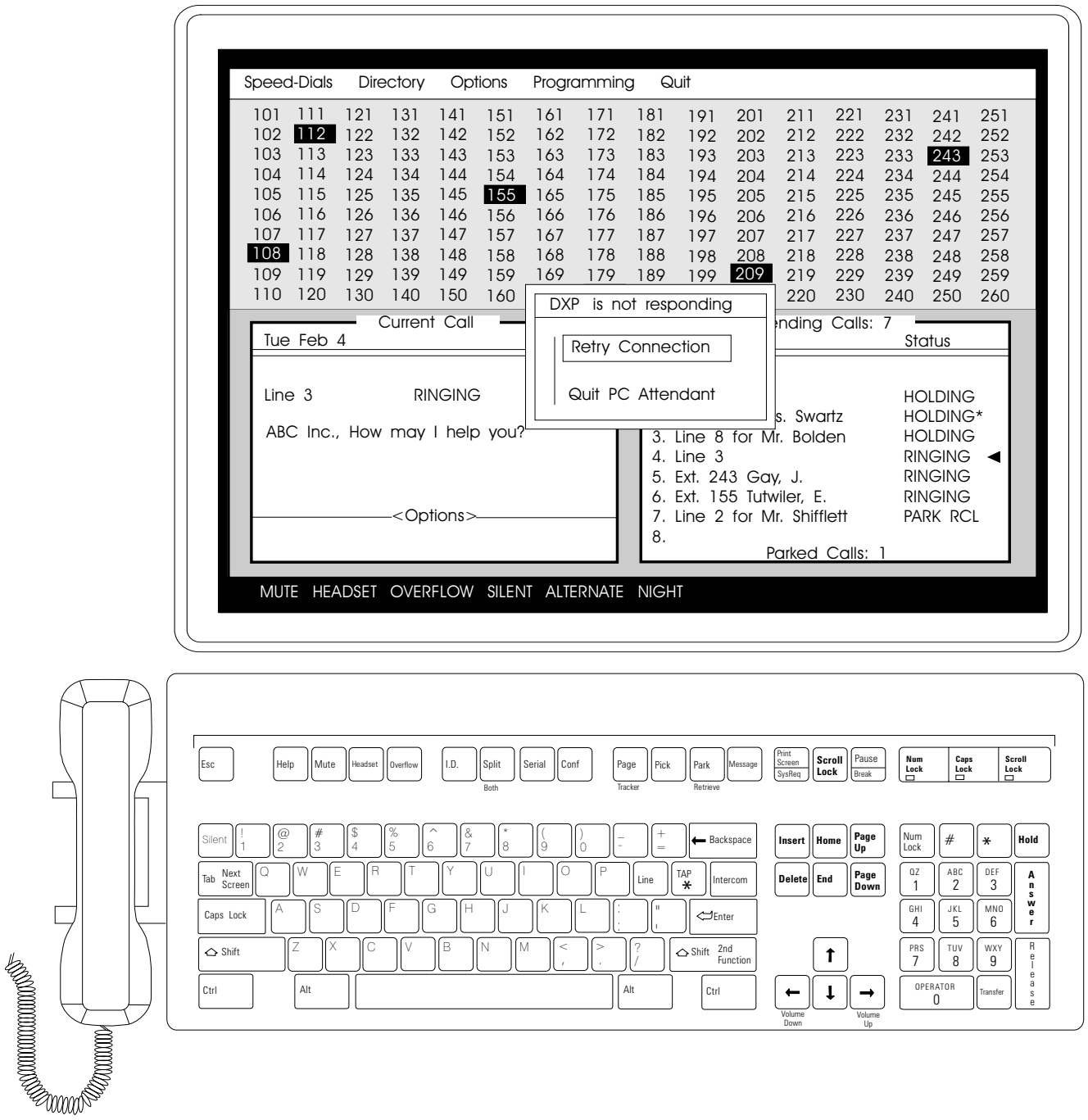
ILLUS27B



4.1.2 KSX-200 Not Responding

When the KSX-200 system is shut down for more than 30 seconds or when the data connection between the PC and the system is broken, a window with "KSX-200 Not Responding" will appear on the screen and two options will be available: "Retry Connection" will cause the PC Attendant to attempt to re-establish communication with the system. (If this is successful, the System Reset window will appear, at which time you may choose "Continue" or "Reload Data.") Selecting the "Quit PC Attendant" option will cause the PC to exit the PC Attendant software package.

ILLUS27A



5 Glossary

A

All-call paging: Paging through the intercoms of all stations in the system.

Alternate mode: Allows all call activity to be routed to an alternate attendant's telephone.

Answer key: Answers currently ringing (priority) call.

Arrow keys: Move cursor within a selected window.

Automatic callback: After a station has set an automatic callback for a busy station, the system will ring the station when the called telephone is no longer busy.

B

Backspace key: Causes previous help screen to be displayed.

Both key: Establishes a conference between the PC Attendant console, a current call, and the last call put on hold.

C

Call I.D. (call tag): A name, word or phrase the attendant creates for a current call in order to identify the call if it recalls to the attendant's station.

Call forward: Designating another telephone to receive all calls normally directed to the user's telephone.

Call park: Placing an active call in system hold (park orbit) and retrieving it by any telephone.

Call pickup: Answering a call at one telephone when it is ringing at another telephone.

Call transfer: Transferring a call from one station to another. The transfer can be screened (i.e., you find out who is calling and announce the call to the party being called) or unscreened (i.e., you transfer the call without identifying the calling party to the called party).

Central message desk: A station that has been assigned to control message waiting lights and deliver messages to other stations in the system.

Class of Service programming: Customized programming of your system by the installer that establishes the basic operating parameters of the system and individual stations.

Conference key: Allows attendant to establish a conference call for up to 5 parties (including Attendant).

Current Call window: Displays information about and options for handling the current incoming call.

Cursor: A flashing, highlighted position indicator that shows where (on the screen) text will be entered (during typing) or which feature or option is currently being recognized by the computer as a selection made by the attendant.

D

Data Link Error: This phrase appears on the PC Attendant's monitor if there has been a temporary loss of communication between the PC Attendant station and the DXP operating system. The system will reset itself in order to continue call-handling activities.

Delete key: allows attendant to delete extension numbers from the Intercom window.

Dialpad: Buttons 0 through 9, ✻ and # used for dialing.

Direct Inward Station Dialing (DISD): Allows an outside party to call an intercom station directly without an attendant's assistance.

Direct Station Selection/Busy Lamp Field (DSS/BLF): Using one button to place intercom calls. Busy lamp field or BLF is a term for a light that identifies current call status of a DSS station.

Directory: Contains a list of all available intercom numbers and any names associated with those numbers.

Do not disturb: A mode that disables incoming call ringing (audible) and intercom calling.

DXP operating system: The DXP hardware/ software equipment combination that controls all call activity and all system features.

E

End key: Moves cursor to the end of current window.

Enter key: Launches or initiates selected functions.

Escape key: Returns the PC Attendant to a main screen from a Help screen; allows attendant to move the cursor from the main screen to the pull-down menus.

H

Headset key: Allows attendant to alternate between handset and headset modes. When headset is activated, handset remains active for listening only.

Help key: Activates context-sensitive Help screens.

Hold key: Places current call on hold.

Home key: Moves cursor to beginning of current window.

I

I. D.: Allows the attendant to enter a short tag (up to 14 characters) to an incoming call in order to identify the call if it returns to the attendant.

Insert key: Allows attendant to add extension numbers to Intercom window.

Intercom key: Allows attendant to make calls to any extension within the system.

Intercom window: Displays the names/numbers and status of all intercoms within your system.

L

Line greeting: A message (up to two lines in length) that appears when a call comes in on a line for which a particular greeting is needed. The attendant assigns these greetings to the lines through system programming.

Line key: Allows attendant to make an outgoing call.

M

Menu bar: Appears at the top of the main screen; provides system programming and call-handling options.

Message key: Activates a message-waiting light at a station; accesses the text messaging features.

Mute key: A fixed feature button that keeps a distant party from hearing your conversation.

N

Night transfer: Transferring incoming calls to a particular station or stations for off-hour answering.

O

On-line help: Help screens that provide information about various features of the PC Attendant console.

Overflow key: Directs incoming calls to an overflow attendant during peak activity. Calls will ring at both stations.

P

Page key: Allows attendant to choose a zone in which a paging announcement will occur. After zone is activated, announcement can be made.

Park key: Places a call in one of nine park orbits.

Park orbits: Nine system-provided "spaces" where a call can be placed and held until a park-retrieve feature is engaged (usually from any telephone within the system). Calls placed in park orbit are held there for a specified period, after which they will recall to the PC Attendant station for service if they are not retrieved.

Pending Calls window: Displays the origin and status of up to eight calls within the system.

Pick key: Performs a directed call pick up.

Prime line: A line designated to a particular telephone and automatically selected when the handset is lifted or when the Line key is pressed.

Priority call: Determined by the system, a priority call is either an incoming call or a recalling hold, transfer or parked call that is first in line to be answered at the attendant's station. It can be identified by the flashing arrow next to it.

Programming menu: Contains various programming features that can be carried out at the PC Attendant console.

Pull-down menu: Located in the menu bar, these menus can be "pulled down" (using the mouse or the arrow and Enter keys) to access options and features.

R

Recall: A call that returns to the PC Attendant after it has been on hold or in transit (through transfer, conference transfer, or park orbit) without being answered.

Release key: Disconnects the PC Attendant from the current call.

Retrieve key: Retrieves a call from park orbit.

Ringing line preference: An automatic connection to any outside line ringing at the station when the station handset is taken off-hook.

S

Screen attributes: The color or brightness characteristics of an item displayed on the screen.

Subdued off-hook voice announce (SOHVA): A private announcement made to a busy party through the handset.

Serial key: Places a call in a series of transfers (to a maximum of three extensions within the system).

Shift/2nd Function key: Accesses a key's secondary function (e.g. Retrieve is the secondary function on the Park key) when held down during key selection.

Silent key: Silences currently ringing call.

Speed dial: Autodialing using the speed dial feature. Speed dialing can be station calls (personal and accessed by only one specific user) or system calls (numbers used and accessed by anyone in the system).

Split key: Allows attendant to alternate between a current call and the last call placed on hold. When one of the calls is activated, the other is automatically placed on hold.

Start-up disk: A computer floppy disk that contains the information necessary for the PC Attendant to operate.

Status indicators: Found at the bottom of the screen, they tell whether a feature is active.

T

Tab/Next Screen key: Moves cursor to next screen or window.

Tap key: Retrieves the last call placed on hold, transferred, or parked in orbit.

Test busy: A feature (on the Options menu) that allows the attendant to determine the status of a line.

Tracker: The optional paging system that allows an attendant to send a message to a compatible pager.

Transfer: Transfers current call to another station.

V

Voice announce blocking: A telephone can be set to block voice calls sent to it over the speaker.

Volume keys: Control volume of ringer, handset and headset.

Z

Zone paging: Paging through the intercoms of some stations or departments in the system.

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COMDIAL®

Installing And Programming The Tracker Paging System On The DXP Digital Communications System

1.0 Introducing The Tracker Paging System

The Tracker Paging System consists of a Tracker base station interfaced through the DXP digital communications system to communicate with one or more Tracker pagers (personal pocket pagers) associated with the system's station ports. This option gives the system the capability to signal system station users when they are away from their telephones that they have a waiting call. The system supports a maximum of 600 Tracker pagers and four base stations. You can install a Tracker base station to serial data ports RS232 1 or RS232 2 provided by the CPU board or to a serial data port supplied by a communications card installed in the DXP. At sites that include a PC attendant position, you can connect the Tracker base station directly to the PC attendant position computer. With this arrangement if a Tracker user has an alphanumeric pager model, he or she can receive a short text message from the PC attendant position.

2.0 Installing The Tracker Paging System

Use the Tracker cable kit to interconnect the Tracker Paging System with the DXP or the PC attendant position. The cable kit includes the factory-wired items described in the following list:

- modular to EIA 25-pin adapter plug with male DB25 Connector,
- modular to EIA 25-pin adapter plug with female DB25 Connector,
- custom-wired six-position modular line jack (not required with PC attendant position installations),
- 3-pair standard line cord.

When using the kit-supplied parts to make the system interconnections, be aware of the location parameter detailed in the statement that follows:

- The maximum distance between the Tracker base station and the common equipment cabinet is limited to 50 feet regardless of which DXP circuit board provides the communications card or where the PC attendant position is located . Longer distances require the use of limited distance modems.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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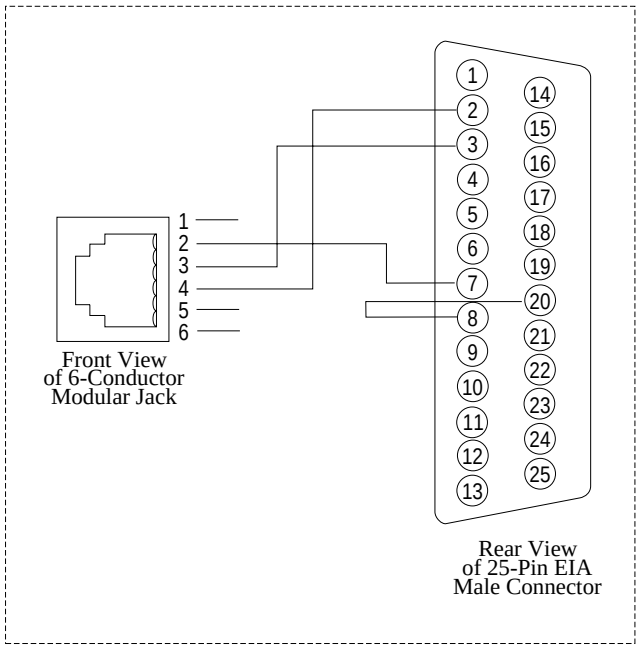
2.2 Installing A Tracker Base Station With The DXP

1. Install the kit-supplied modular jack and wire it to the DXP serial data port that you plan to use. Use customer-supplied cabling for this wiring path.

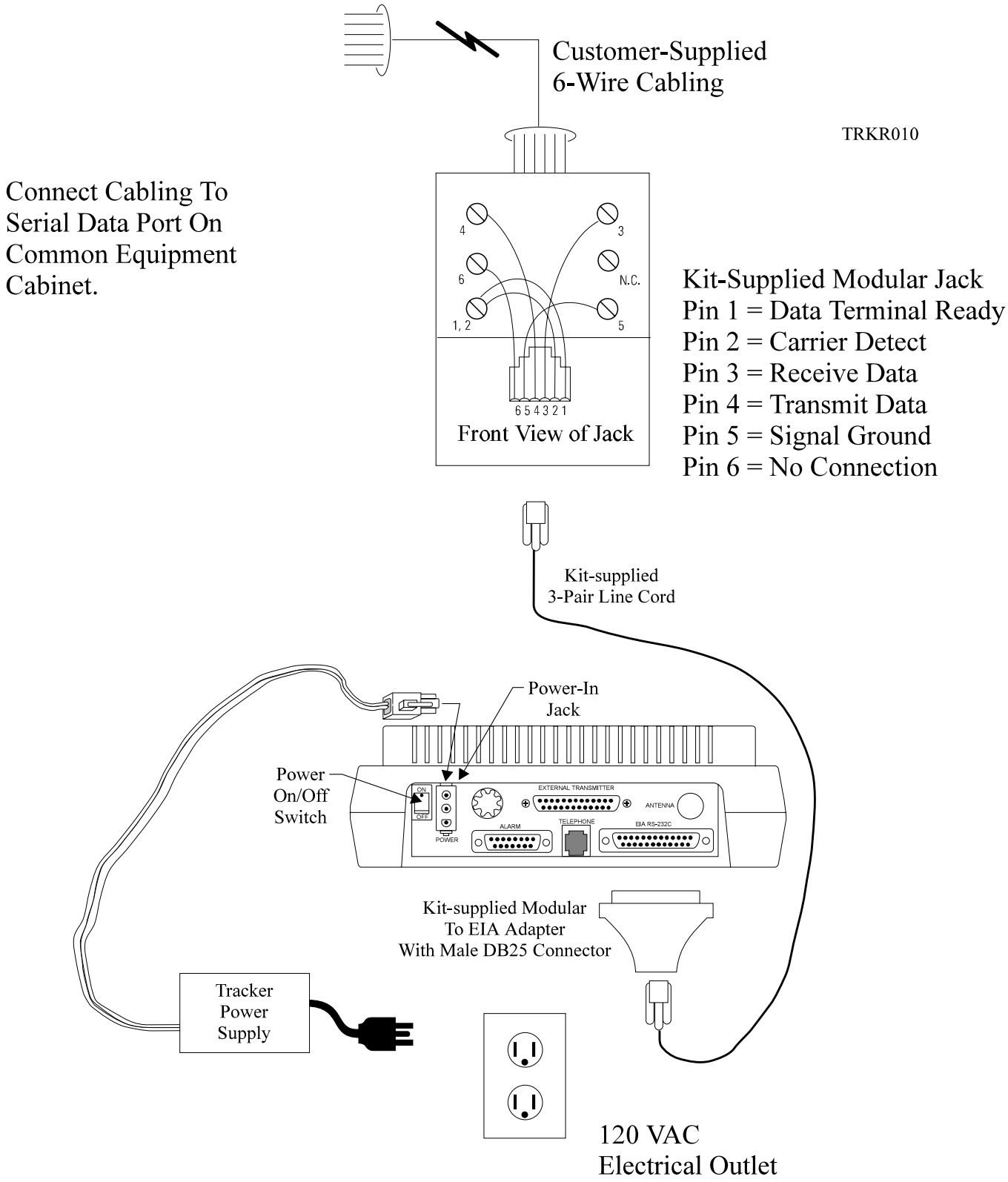
CAUTION

You must use the kit-supplied modular jack as it provides customized wiring necessary for proper equipment operation.

2. Select the kit-supplied, modular to EIA adapter with the male DB25 connector, and connect it to the 25-pin serial data connector on the rear of the Tracker base station, and secure it with the thumbscrews provided.
3. Plug one end of the kit-supplied modular line cord into the modular to EIA adapter.
4. Plug the other end of the cord into the kit-supplied modular jack that you installed in step 1.
5. Connect the power supply output cable to the rear of the Tracker base station.
   a. Plug the AC power cable from the power supply into a 120 VAC wall outlet.
   b. Turn on the base station's power switch.
6. Refer to Section 3 for details, and make the necessary programming arrangements:
   —program the system serial data port parameters,
   Baud Rate 9600,
   Data Bits 8,
   Stop Bits 1,
   Parity none,
   Flow Control none,
   —enable the Tracker Paging System,
   —assign a pager number to a system intercom number,
   —program the pager types,
   —enable the pagers for operation.



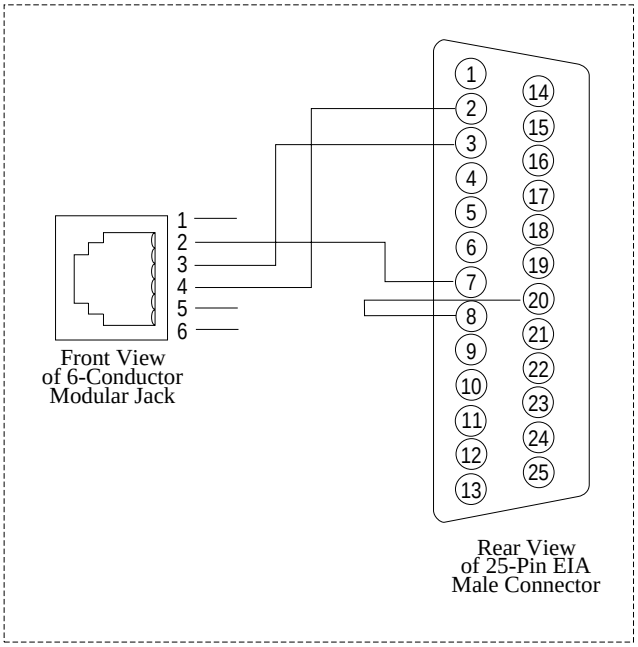
Detailing The Kit-Supplied Modular To EIA Adapter For Tracker Base Station



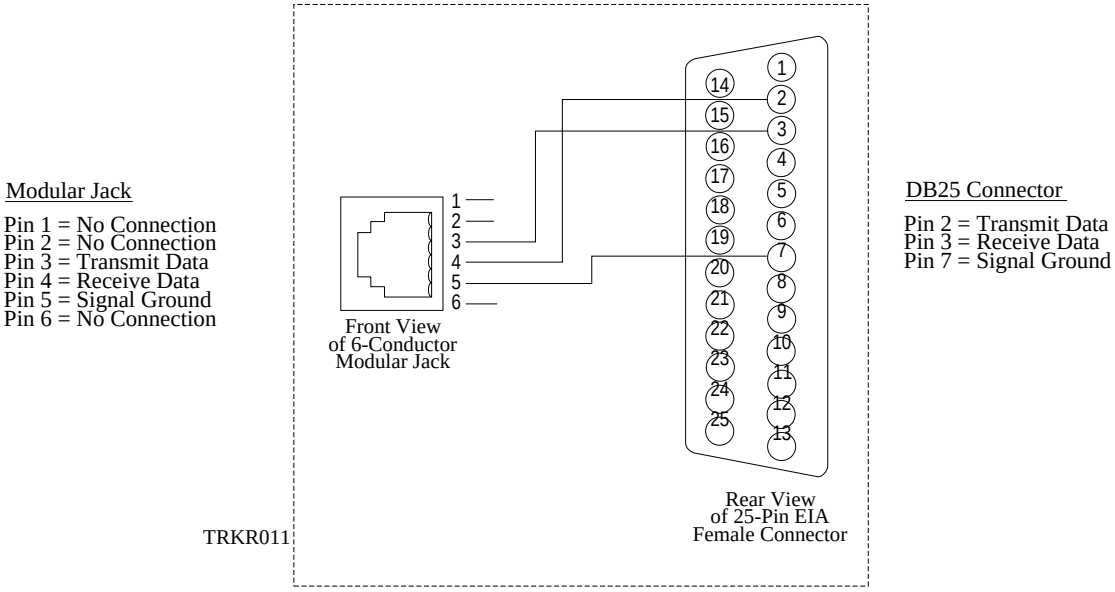
Installing Tracker Paging System To A Common Equipment Cabinet

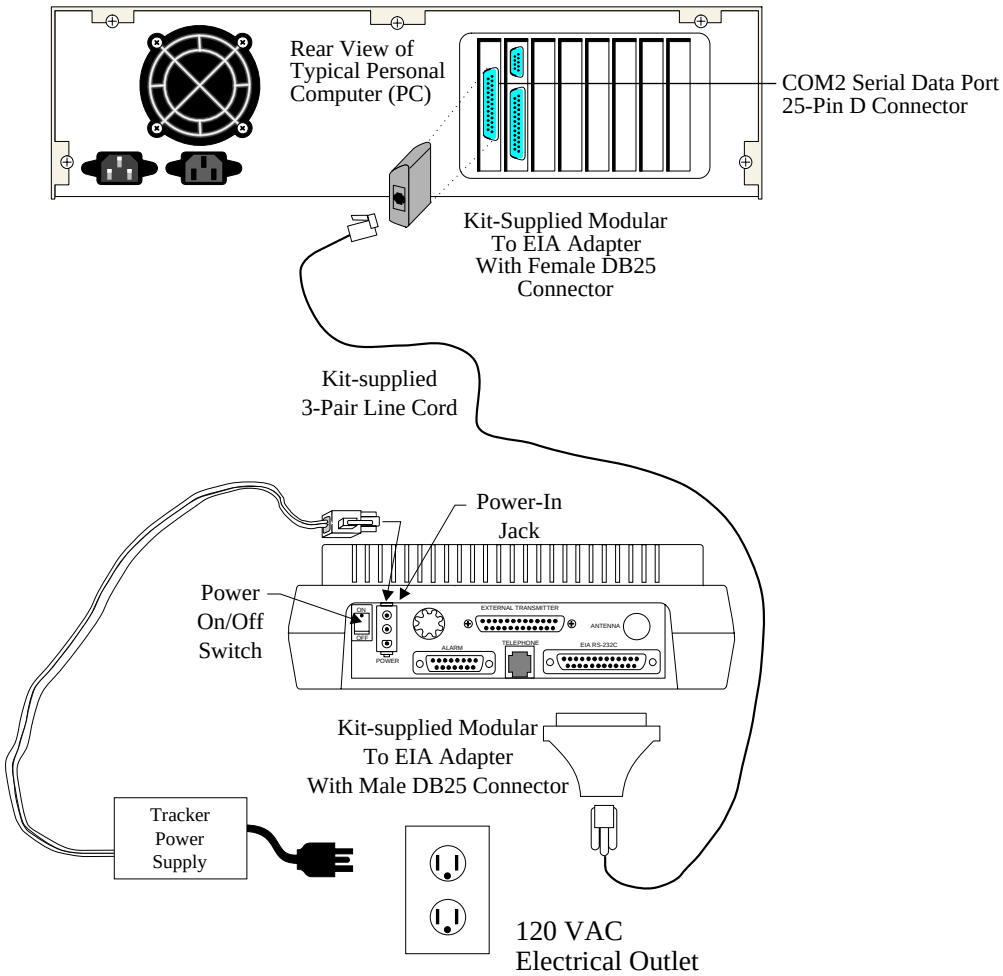
2.2 Installing A Tracker Base Station With The PC Attendant Position

1. Select the kit-supplied modular EIA adapter with the male DB25 connector, and connect it to the 25-pin serial data connector on the rear of the Tracker base station, and secure the adapter with the thumbscrews provided.
2. Plug one end of the kit-supplied modular line cord into the adapter installed in step 1.
3. Select the kit-supplied modular to EIA adapter with the female DB25 connector, and connect it to the COM2, 25-pin, serial data connector on rear of the PC attendant position.
3. Plug the other end of the line cord into the adapter installed in step 3.
5. Connect the power supply output cable to the rear of the Tracker base station.
   a. Plug the AC power cable from the power supply into a 120 VAC wall outlet.
   b. Turn on the base station's power switch.
6. Refer to Section 3 for details, and make the necessary programming arrangements:
   —program the system serial data port parameters,
   Baud Rate 9600,
   Data Bits 8,
   Stop Bits 1,
   Parity none,
   Flow Control none,
   —enable the Tracker Paging System,
   —assign a pager number to a system intercom number,
   —program the pager types,
   —enable the pagers for operation.



Detailing The Kit-Supplied Modular To EIA Adapter For Tracker Base Station





Installing A Tracker Base Station To A PC Attendant Position Using Kit-Supplied Modulat To EIA Adapter

3.0 Programming For The Tracker Paging System

There are three levels of programming associated with Tracker operation.

The system level, is done by the installer or system programmer when he or she performs the data base programming. This programming level installs Tracker operating parameters and the pager-to-intercom assignments that can only be changed by the system installer.

The PC attendant position level is done by an attendant from an installed PC attendant position. The PC attendant position operates in one of two modes—local or system. In the local mode, the attendant assigns pagers to intercoms and selects pager types. This programming is transparent to the DXP *Plus* system and does not alter any installer programming done at the system level. In the system mode, the PC attendant position monitor displays all installer-programmed Tracker operating parameters and pager-to-intercom assignments.

The system manager level is done from the system programming station. The system manager dials codes to enable or disable the Tracker Paging system.

3.1 Performing Tracker Paging System Programming

3.1.1 Programming Tracker Paging System Options

Description: Tracker Paging System options consist of selecting the serial port that you will use for connecting the base station, enabling or disabling Tracker Paging System operation, and selecting PC Attendant 1 through 4.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select Peripherals and press ENTER.
3. From peripherals menu, select Tracker and press ENTER.
4. From Tracker menu, select Options and press ENTER.
5. Enter Tracker Paging System base station number (1 through 4) and press ENTER.
6. From tracker unit options menu, select the serial port where the Tracker base station will be connected (1 through 18) and press ENTER.
7. Toggle the second field with the SPACE bar to enable/disable the Tracker Paging System option and press ENTER.
8. Toggle the third field with the SPACE bar to select PC Attendant 1 through 4 (or none) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Press ESCAPE to end.

NOTE: After you have enabled the Tracker paging system and saved your programming selections, the DXP system connects with the Tracker base station and displays the following message:

Initializing TRACKER unit, please wait. . .

If the Tracker base station is correctly installed and operational, the DXP system displays the following message:

Installation complete, TRACKER is on line

If, however, the Tracker base station is not installed or fails to connect, the DXP displays the following message:

Installation error, verify programming or installation

3.1.2 Making Tracker Paging System Assignments

Description: Use the following programming instructions to assign individual Tracker Pagers to a station extension number, select the pager types, and assign a block of pagers to a Tracker Paging System base station. Use this programming method for making minor modifications after the system has been installed and programmed.

Programming:
1. Press CONTROL T for main menu.
2 From main menu, select Peripherals and press ENTER.
3. From the peripherals menu, select Tracker and press ENTER.
4. From tracker menu, select Pager Assignment Table and press ENTER.
5. In the first field, enter intercom number and press TAB.
6. In the third field, enter Tracker Pager number and press TAB. (The second field is the name field that is programmed in the intercom numbers screen.)
7. In the fourth field, press the SPACE bar to enable/disable the Tracker Pager and press TAB.
8. In the fifth field, press the SPACE bar to select Tracker Pager type P1000 through P4000.

NOTE: Tracker pager designations are:
P1000 (numeric display only)
P2000 (1-line alphanumeric display)
P3000 (2-line alphanumeric display)
P4000 (4-line alphanumeric display)

9. After making pager type selection, press TAB.
10. In the fifth field, type Tracker base station's number (1 through 4).
11. When finished, press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
13. Press ESCAPE to end.

3.1.3 Making Initial Tracker Pager Assignments

Description: Use the following programming instructions to select intercom numbers, to assign pager types, and to assign individual pagers to a Tracker base station. Use this programming method to make many assignments quickly when first installing the system. This programming method overwrites any assignments previously made.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select Peripherals and press ENTER.
3. From the peripherals menu, select Tracker and press ENTER.
4. From tracker menu, select Initialize Pager Assignments and press ENTER.
5. From the initialize pager assignments menu, select Intercom Number(s) and press ENTER.
6. Press CTRL-E to display Intercom Numbers Table.
7. Select a to add or r to remove intercom numbers and press ENTER.
8. Enter one intercom number or a group of intercom numbers (example: enter 101-150 to initialize those fifty intercom numbers at one time) and press ESCAPE.
9. Select Pager Number and press ENTER.
10. Enter pager number located on pager and press ENTER.
11. Press SPACE bar to enable or disable the intercoms and press ENTER.
12. Press SPACE bar until the pager model number you are using is displayed and press ENTER.
13. Enter the Tracker base station number (1-4) and press ESCAPE twice.
14. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
15. Press ESCAPE to end.

3.1.4 COS Programming For Tracker Access

Description: Assign tracker access to a particular station intercom or group of intercoms using the following class of service (COS) programming. (The default is yes for COS1 and COS32.)
The procedure actually assigns Tracker access as a class of service feature. You must also assign that class of service to those stations that you want to have Tracker access.

Programming: To assign Tracker access as a class of service feature,

1. Press CONTROL T for main menu.
2. From main menu, select Stations and press ENTER.
3. From stations menu, select COS Programming and press ENTER.
4. From COS programming, type class (1–32) and press ENTER.
5. From COS (class number) programming, select Tracker Access.
6. Toggle the SPACE bar to select yes/no and press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Press ESCAPE to end.

To assign the Tracker class of service to a station,

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type desired value for feature and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

3.2 Enabling The Tracker Paging System With The PC Attendant Position

Description: To use the paging system, the attendants must first enable the feature in either the *local* mode or in the *system* mode. In either mode, they can create and send up to eight default messages.
In the local mode, attendants make their own intercom-pager assignments. These assignments will not change any assignments previously programmed into the DXP by the installer or system programmer. To use the local mode, attendants must have the Tracker base station plugged into the PC attendant position computer at the port designated on the Tracker Status pull-down menu.
In the system mode, Tracker selections are identical to those programmed in the DXP by the installer and any changes made in the system mode will be automatically sent to the DXP. The installer must program the Tracker for remote installation using the procedure detailed *Section 3.1.1*.

Programming: To enable Tracker,

1. Activate the Programming pull-down menu.
2. Press **ALT-P** and press **Enter,**
   —OR—
   press **Esc** to move the cursor into the menu bar from the main screen.
3. Position the cursor on *Programming*, and press **Enter.**
4. Move the cursor to highlight *Tracker Options*.
5. Press **Enter.**
6. Move the cursor to highlight *Disable/Enable Local/Enable System*.
7. Press **Enter.**
8. Move the cursor to highlight the appropriate choice and press **Enter.**

3.3 Enabling The Tracker Pager System From The Programming Station

Description: The system manager can enable and disable Tracker pager operation by taking action at the system programming station.

Programming:

1. Press INTERCOM, dial ✳#746✳.
2. Dial 19.
3. Dial tracker number 1—4.
4. Dial 1 to enable, 2 to disable, or press # to toggle between enable and disable.

COMDIAL®

Installing And Programming The Digital Voice Announce Equipment On The DXP Digital Communications System

1.0 Understanding The Digital Voice Announce Equipment

The digital voice announce device (DVA) is an optional line-powered unit that connects to a digital station port and plays pre-recorded voice prompts and dialing instructions to incoming callers on the direct inward system access (DISA) lines.

Currently, DISA is the only DXP feature to take advantage of the DVA's voice prompting capability; therefore, for the DVA to function, **you must have DISA lines assigned and programmed**. The maximum number of DVA units you can install is limited only by the number of DXP station ports. Once you connect the DVA to a digital station port, the DVA identifies itself to the DXP so you do not have any phone-type programming to do. Nor is it necessary for you to program the system to send DTMF or ringing signals to activate the DVA because DISA programming determines the DVA's actions. When you use a DVA in conjunction with DISA, the DXP automatically answers the DISA lines and guides the callers with DVA originated voice prompts.

A DVA accepts and stores up to four recorded messages, with a total maximum recorded time for all messages of two minutes. Using system attendant programming, you can divide this two-minute period as necessary among the four messages or use the entire two minutes for one message. These pre-recorded messages play during an in-process call and prompt callers to dial a single digit to reach a particular intercom number or feature code. For each message type, you can assign up to ten intercom numbers or feature codes and assign a single access digit to each of these intercom numbers.

Each message type has a two-digit system index number (for example: 10 = Welcome Greeting 1, 11 = Welcome Greeting 2, and so forth). You use this index number to identify the messages when you record them. Many of the messages have a single-digit group option number appended to their names (for example: Welcome Greeting 1, Day Main Menu 1, and so forth). You, use this message group number to place messages for a particular category of caller together (all group 1 messages for sales calls, all group 2 messages for service calls, and so forth). You assign a message group to a DISA line based on the line's DISA voice option. Group 1 messages correspond with DISA voice option 1, group 2 messages with DISA voice option 2, group 3 messages with DISA voice option 3 and group 4 messages with voice option 4. You assign a voice option, and thus a message group, to a DISA line.

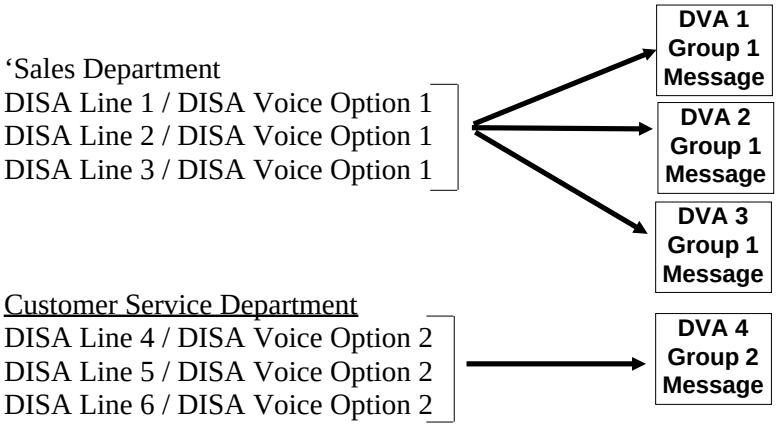
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1.1 Understanding The Line/Voice Option/DVA Relationships

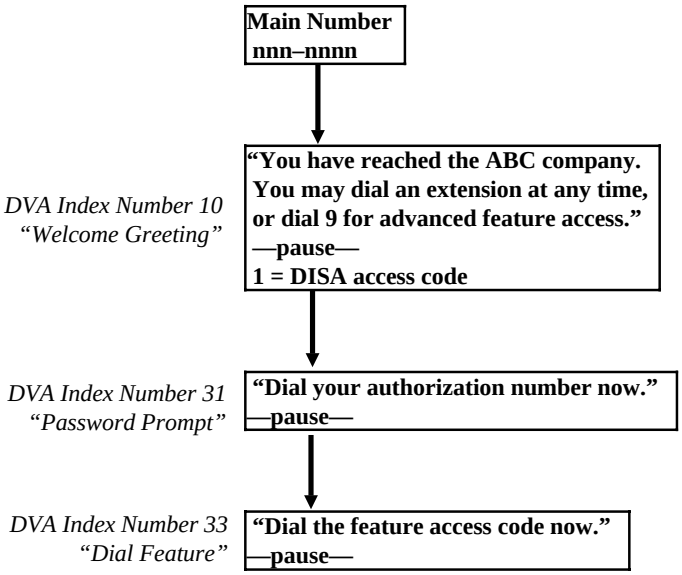
1.1.1 DVA Application

A company with several departments reserves all group 1 messages for the sales department and reserves all group 2 messages for the customer service department. The company attendant records the group 1 and 2 message to have meaning for the sales and customer service departments. The system programmer assigns DISA lines 1, 2, and 3 to the sales department and DISA line 4, 5, and 6 to the customer service department. He or she also programs DISA line 1–3 to have voice option 1 and DISA line 4–6 to have voice option 2. All of this allows callers to DISA line 1–3 to receive and respond to messages associated with the sales department and callers to DISA line 4–6 to receive and respond to messages associated with the customer service department.


'Sales Department
DISA Line 1 / DISA Voice Option 1
DISA Line 2 / DISA Voice Option 1
DISA Line 3 / DISA Voice Option 1
DVA 1 Group 1 Message
DVA 2 Group 1 Message
DVA 3 Group 1 Message
Customer Service Department
DISA Line 4 / DISA Voice Option 2
DISA Line 5 / DISA Voice Option 2
DISA Line 6 / DISA Voice Option 2
DVA 4 Group 2 Message

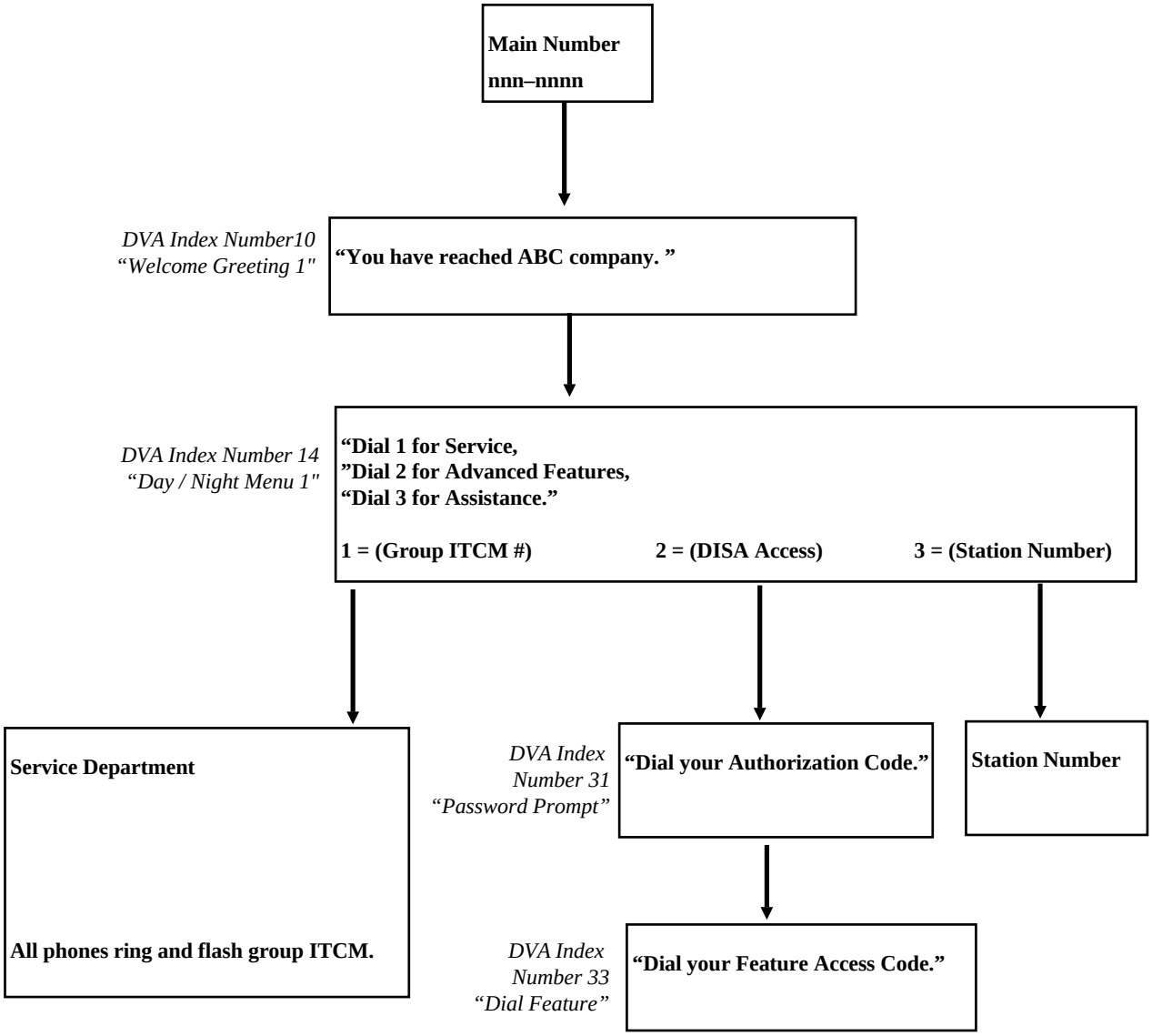
1.1.2 DVA/DISA Application

You can enhance the security of DISA by using the DVA. The DXP connects to the incoming call based on the programmed DISA parameters and the DVA plays the appropriate prompts to cause the caller to dial the following codes: DISA access code, authorization code, feature access code.


Main Number nnn–nnnn
DVA Index Number 10 "Welcome Greeting"
"You have reached the ABC company. You may dial an extension at any time, or dial 9 for advanced feature access."
—pause—
1 = DISA access code
DVA Index Number 31 "Password Prompt"
"Dial your authorization number now."
—pause—
DVA Index Number 33 "Dial Feature"
"Dial the feature access code now."
—pause—

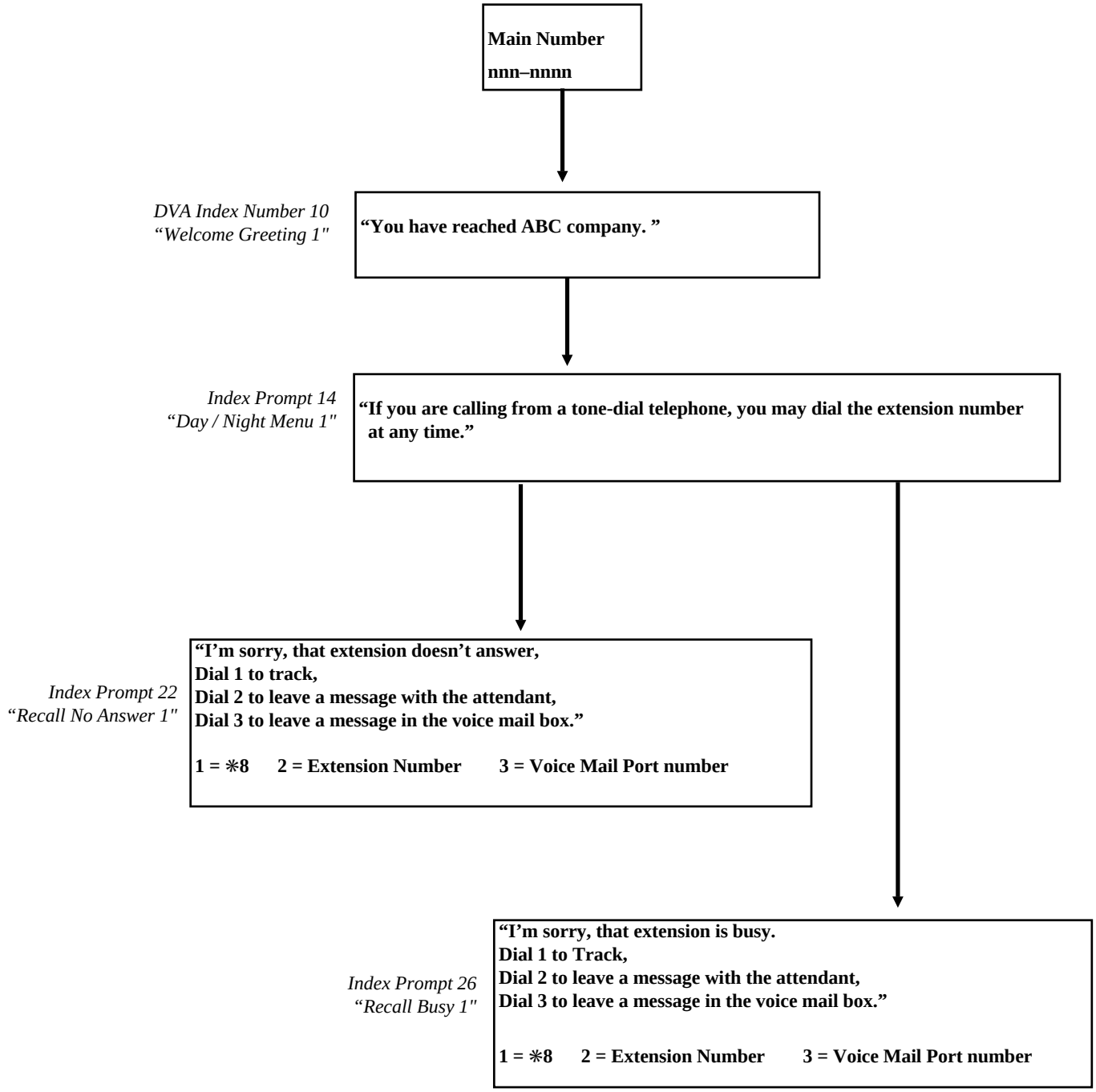
1.1.3 DVA Auto Attendant With Single Digit Menu Application

The DVA functions as an automatic attendant by giving callers single-digit dialing options. The DXP connects to the incoming call based on the programmed DISA parameters and the DVA plays the appropriate voice prompts to the caller such as: welcome greeting, day main greeting—menu choices, recall busy, recall no answer.



1.1.4 DVA/Tracker Paging System Application

The DVA gives callers single digit dialing access to the Tracker Paging System. The DXP connects to the incoming call based on the programmed DISA parameters and the DVA plays the appropriate voice prompts to the caller such as: welcome greeting, day main greeting—menu choices, recall busy, recall no answer.


Main Number
nnn–nnnn
DVA Index Number 10
"Welcome Greeting 1"
"You have reached ABC company. "
Index Prompt 14
"Day / Night Menu 1"
"If you are calling from a tone-dial telephone, you may dial the extension number at any time."
Index Prompt 22
"Recall No Answer 1"
"I'm sorry, that extension doesn't answer,
Dial 1 to track,
Dial 2 to leave a message with the attendant,
Dial 3 to leave a message in the voice mail box."
1 = ✳8 2 = Extension Number 3 = Voice Mail Port number
Index Prompt 26
"Recall Busy 1"
"I'm sorry, that extension is busy.
Dial 1 to Track,
Dial 2 to leave a message with the attendant,
Dial 3 to leave a message in the voice mail box."
1 = ✳8 2 = Extension Number 3 = Voice Mail Port number

1.2 Defining DVA Messages

The available DVA messages include the following categories

DVA Index Number	Message Type	Message Definition
10–13	Welcome Greetings 1–4	Messages that identify company or department to caller.
14–17	Day Main Menus 1–4	System plays these messages during normal business hours.
18–21	Night Main Menus 1–4	System plays these these messages during close of business hours.
22–25	Recall No Answer 1–4	System plays these messages when the called station does not answer.
26–29	Recall Busy 1–4	System plays these messages when called station does not answer.
30	Please Hold	System plays this message to callers when they page their called party.
31	Password Prompt	This message prompts callers to enter password for access to advanced DISA features
32	Account Code	System plays this message to callers who request line groups on systems that require forced account code entry
33	Dial Feature	This message plays after the caller enters password for advanced DISA features
34–37	Day Routing 1–4	If system can not provide DISA callers with the requested service, it plays this message.
38–41	Night Routing	
42	Reminder Prompt	DISA Callers who are allowed to access advance system features receive this message if they are making a line to line connection through the DXP. The message periodically prompts them to dial a code to continue the connection.
43	Digit Collection	This message prompts callers to dial a code before the system routes their call. When used with telephony services, this dialed code causes a screen showing caller's identification and data to appear on computer at called station's location. System plays the message requesting the dialed entry after a welcome message and before a day menu message. Digit collection message plays first if there is no welcome message and plays after the default routing extension if there is no day menu message. The caller dialed digits also show on the called station's display

1.3 Defining Battery Operation

The DVA derives its operating power from the station port; however, the DVA also has an internal battery for supplying power to the memory that holds the stored messages. In the event that the DXP should lose power or should someone disconnect the DVA for some reason, the battery provides back up power to save the stored messages.

CAUTION

If battery power is lost, the currently stored messages will be lost. In this case, you will need to format and re- program the DVA. Formatting clears the DVA channels and conditions them to accept newly recorded messages for storage.

The battery has a charge time of 48 hours and a discharge time of one hour. When replacing the battery, use one with the following specifications:

3 Output—8.4 volts, 100 mAh
3 Type—sealed, rechargeable Ni-Cd battery
3 Model—Varta V7/8R (Varta Batteries Inc., 300 Executive Blvd., Elmsford, NY 10523)

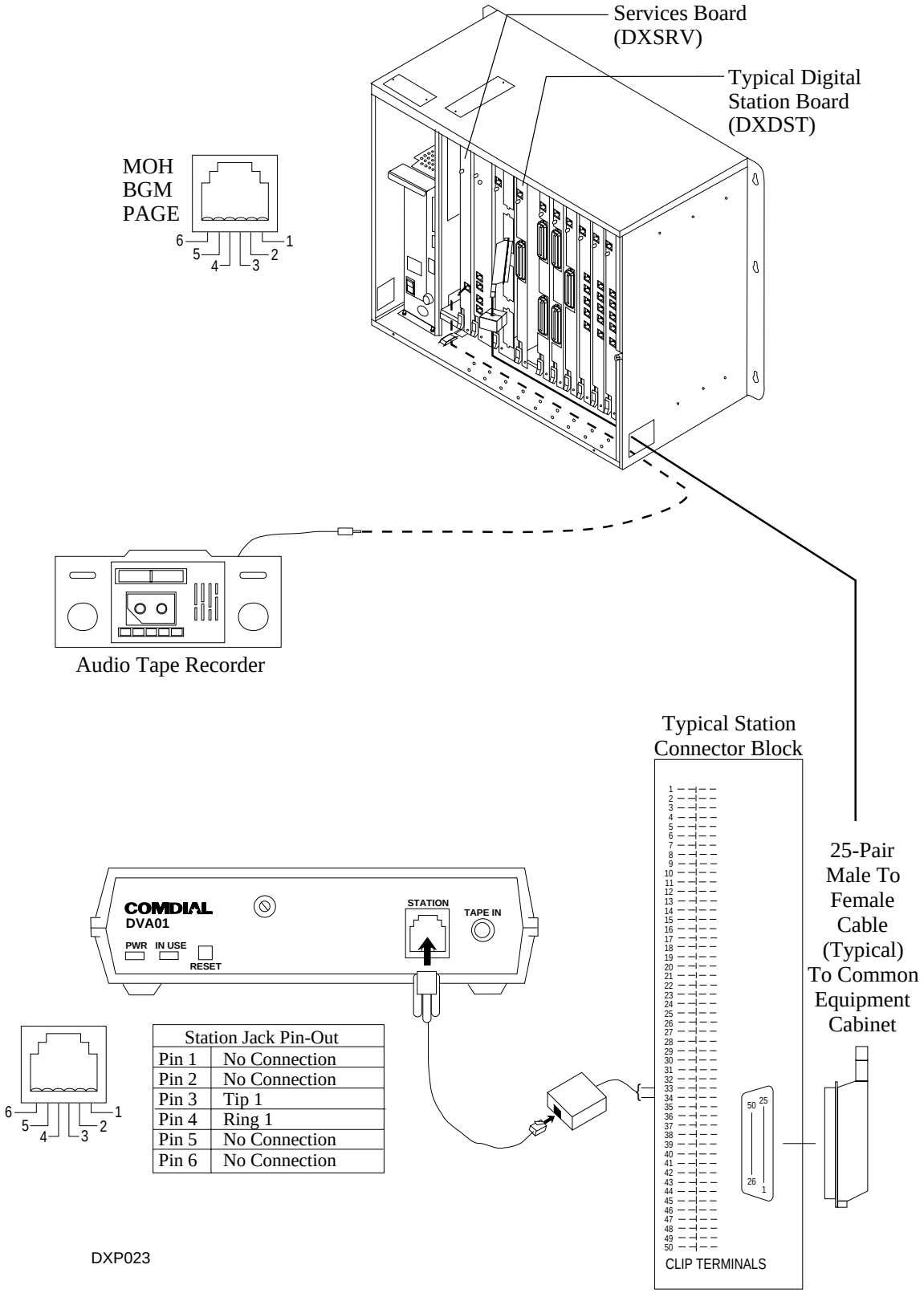
WARNING

Dispose of the used battery in accordance with local and state regulations covering safe disposal of Ni-Cd rechargeable batteries.

2.0 Installing The DVA

Install the DVA on the DXP by performing the steps listed below and the illustration shown on the next page.

1. Position the DVA in a convenient location.
2. Connect the DVA to a digital station port using a standard two-wire line cord.
3. Connect a customer-supplied tape recorder (optional) to the DXP music interface MOH/BGM jack on the services board. You can use the connections for either audio source—music on hold (MOH) or background music (BGM).



Station Jack Pin-Out	
Pin 1	No Connection
Pin 2	No Connection
Pin 3	Tip 1
Pin 4	Ring 1
Pin 5	No Connection
Pin 6	No Connection

Connecting The DVA

3.0 Programming For DVA Operation

3.1 Programming The Interaction Between DVA And DISA

3.1.1 Performing DISA Specific Programming

Description: The purpose of the DISA specific programming is to perform the following tasks:

- Enable extensions where day/night DISA calls will be routed when call-routing is necessary,
- Enable proprietary voice mail to receive DISA calls and route the calls to a dedicated mailbox that holds the appropriate intercept greetings,
- Select access lockout time (the amount of time that the line remains locked-out from use after invalid conditions occur—such as, when a caller repeatedly dials an invalid authorization code),
- Select the time-out period for DISA extensions that ring without answer (RNA),
- Select the maximum time-out period for the reminder tone that sounds during an in-process call when the DISA caller is using an outside line and the system has no disconnect supervision. This tone sounds at set intervals to remind the caller that he or she must dial a code (any single digit) or be disconnected within 10 seconds,
- Select the option to either route a DISA call or drop it after caller dials an invalid authorization code

Programming:

1. Press CONTROL T for main menu.
2. From main menu, select Lines and press ENTER.
3. From the lines menu, select DISA configuration and press ENTER.
4. From the DISA configuration menu, select Day Routing Extension and press ENTER.
5. Type day routing extension number and press ENTER.
6. Type night routing extension number and press ENTER.
7. Type voice mail Routing ID (up to eight digits) and press ENTER.
8. Toggle the SPACE bar to select access lockout times (2, 5, 10, 15, 30 minutes) and press ENTER.
9. Type the ring no answer (RNA) rings of 0 through 9, and press ENTER.
10. Toggle the SPACE bar to select Maximum Reminder Time-out periods of (2, 5, 10, 15, 30 minutes) and press ENTER.
11. Toggle the SPACE bar to select Route or Drop from Route/Drop Invalid Access field and press ESCAPE twice.
12. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
13. Press ESCAPE to end.

3.1.2 Enabling Or Disabling DISA Lines

Description: Use the following programming instructions to enable or disable DISA capability on the lines. Also, use the DISA Voice Options 1 through 4 to select digital voice announce (DVA) messages. For example, selecting DISA voice option 2 will cause welcome greeting 2, day main menu 2, night main menu 2, recall no answer 2, and recall busy 2 prompts to play whenever a DISA line is covered by DVA.

Programming
1. Press CONTROL T for main menu.
2. From main menu, select Lines and press ENTER.
3. From the lines menu, select Line Programming and press ENTER.
4. Enter line number you want to program and press ENTER.
5. From the line (number) programming menu (page 2), select DISA and press ENTER.
6. Toggle the SPACE bar to select/deselect DISA and press ENTER.
7. Enter 1 through 4 for the DISA Voice Options and press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Enter the number for the next line you want to program or press ESCAPE to end.

3.1.3 Setting Day 1, Day 2, and Night Ringing Begin and End Times

Description: With this programming procedure, set the begin and end times of the day 1, day 2, and night ringing time periods.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From the system parameters menu, select day 1, day 2 or night ringing begin times and press ENTER.
5. Type times in 24–hour format (hh:mm) and press ENTER.
6. Press ENTER (repeatedly if needed) to place cursor at next time desired setting.
7. Repeat step 5 and press ENTER.
8. Repeat steps 6 and 7 until all times are set and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

3.2 Programming The DVA Parameters

3.2.1 Programming Intercoms For DVA Messages

Description For each message type, you can assign up to ten intercom numbers and assign a single access digit to each of these intercom numbers. You can assign feature codes as well as intercom numbers. For example, if you have installed the Tracker Paging System option, you can program the Tracker Pager access code (✻8) to an appropriate message and assign a single-digit dialing code to the access code. This allows DISA callers to track their called party by dialing the appropriate single-digit when prompted by voice message. The caller then enters his or her call-back number and the # symbol to complete the page.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select voice/DVA and press ENTER.
4. Enter voice message number and press ENTER.

NOTE: You may need to refer to step 5 of the following programming instructions to obtain the voice message number for the message type.

5. Make a single digit selection from the list (1 through 0) and press ENTER.
6. Enter intercom number or feature code that you wish to assign to this message and press ENTER.
7. Press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

3.2.2 Obtaining DVA Status Reports

Description: Use this programming procedure to obtain DVA status information (voice digit translation, voice allocation by DVA, voice allocation by message, and voice resource analysis).

Programming:
1. Press CONTROL T for main menu
2. From main menu, select printouts and press ENTER.
3. From printouts menu, select peripherals and press ENTER.
4. From peripherals menu, select voice/DVA and press ENTER.
5. Make a selection from the voice/DVA menu for the desired status printout and press ENTER.

NOTE: If you select the voice resource analysis you get a list of all message types. You may need this information to complete step 4 in the preceeding programming instructions.

6. For printout type, press s for screen or p for printer and press ENTER.
7. Press any key to return to voice programming printouts menu.

3.2.3 Recording The DVA Messages

Description: You or the system attendant must record the messages that the DVA plays to the callers. You do this in one of two ways: either by delivering them from the telephone handset at the attendant station or by playing the contents of a professionally-supplied tape recording into the DVA memory. Each DVA stores up to four unique messages. The total message storage time is two minutes and you can divide this time as necessary among the four messages or use the entire two minutes for one message if needed. Because of the time constraints, it is a good practice to script your messages ahead of time so that you can read them aloud in a clear and concise manner as you store them in the DVA memory.

CAUTION

It is important to keep in mind that the system shares the messages among all installed DVAs. You do not control which DVA stores which message. For example, if you make eight different recordings with two DVAs, the system distributes the messages in both units. If someone later removes one unit from service, the only messages that will play are those stored in the remaining DVA.

Programming: To record a DVA message,

1. Press INTERCOM and dial ✻ #0 ✻ 061.
2. Choose voice source,
   – dial 1 to speak message into handset,
   – dial 2 to play tape recorded message into music-on-hold jack,
   – dial 3 to play tape recorded message into background music jack,
   – dial 10–43 to choose message type.

   NOTE: As soon as you perform the next step, the two-minute timer starts running. Be ready to speak you message or press the PLAY button on the tape recorder as soon as you dial the replicate choice.
3. Dial 1–9 to choose number of times to replicate message.
4. Speak your message,
   –or–
   press the PLAY button on the tape recorder to start pre-recorded message).
5. Press # to end message.
6. Listen as system automatically plays the message for verification at the attendant station.
7. Press # to stop verification playback.
8. Repeat steps 2–8 until you've recorded all messages.

3.2.4 Editing The DVA Messages

Description: After DVA messages exist, you can play them, copy them, and delete them as necessary using the following attendant programming.

Programming: To play a previously recorded DVA message,

1. Press INTERCOM and dial ✻ #0 ✻ 062.
2 Dial 10–43 to choose message type.
3. Listen as system automatically plays the message for verification at your attendant station.
4. Press # to stop verification playback.
5 Dial 10–43 to choose next message type to hear.

To copy a previously recorded DVA message,

1. Press INTERCOM and dial ✻ #0 ✻063**.**
2. Dial 10–43 to choose message type.
3. Dial 1–9 to choose number of times to copy message.
4. Dial 10–42 to choose next message type to copy.

NOTE: If your installer has connected more than two DVAs to the system, the system automatically selects the DVA that will receive the copied message. Likewise, the system automatically selects the DVA that it uses for playing back the message to a caller. Additional DVAs become a shared resource for the system's memory and are not dedicated to particular lines.

To delete a previously recorded DVA message,

1. Press INTERCOM and dial ✻ #0 ✻064.
2. Dial 10–43 to choose message type.
3. Dial 937 to confirm delete or dial S to deny delete.

To completely erase all DVA messages (format the DVA).

1. Press INTERCOM and dial ✻ #0 ✻065**.**
2. Dial 1–480 to choose DVA port.
3. Dial 937 to confirm formatting dial S to deny formatting.
4. Dial 1–480 to choose next DVA port to format.

COMDIAL®

Installing The Personal Computer Interface Unit

Introducing The Personal Computer Interface Unit (PCIU)

The Personal Computer Interface Unit (PCIU) is a device that you can connect between a digital station port and its proprietary telephone. The PCIU allows telephone users to initiate telephone-related functions from their personal computers (PC). Applications such as this are commonly known as Computer Telephony Integration (CTI) applications. The PCIU will function with Comdial digital telephone systems (the DSU and DSU II systems) and Comdial digital communications systems (currently the DXP, DXP Plus, and FX Series systems).

The PCIU includes Service Provider Interface (SPI) software on computer diskettes. When you install this SPI software on a PC, the PC users can employ their Telephony Applications Programming Interface (TAPI), third-party, Microsoft Windows* applications programs to control many useful telephone functions.

**Microsoft Windows is a registered trademark of Microsoft Corporation, Redmond, Washington*

Depending upon which PCIU model that you purchase, it comes bundled with either wideopen.call or with Visual Call Manager (VCM) software. Wideopen.call is a CTI application that offers on-screen call management and a detailed call log. VCM is a capability of the Versatile Voice Processing (V.V.P.) voice mail system with a revision of 8.2 or later. VCM provides a series of computer-displayed menus that V.V.P. users can use to simultaneously view and manage voice message activity. Of course, to use VCM, you must have the V.V.P. voice mail system installed along with the telephone system.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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Detailing The PCIU Requirements

Minimum PC Requirements

The user-supplied PC must be running the Windows 3.1 or Windows 95 operating system and must provide a serial data port (the PCIU includes a 9-pin to 9-pin serial data cable).

CAUTION

It is important to keep in mind that actual PC performance can be affected by such factors as: processor speed, available memory, disk capacity, and elements associated with several software programs running simultaneously.

Proprietary Telephone Requirements

The PCIU operates properly with any Comdial Impact, Impression, or DigiTech LCD speakerphones that provide interactive button support.

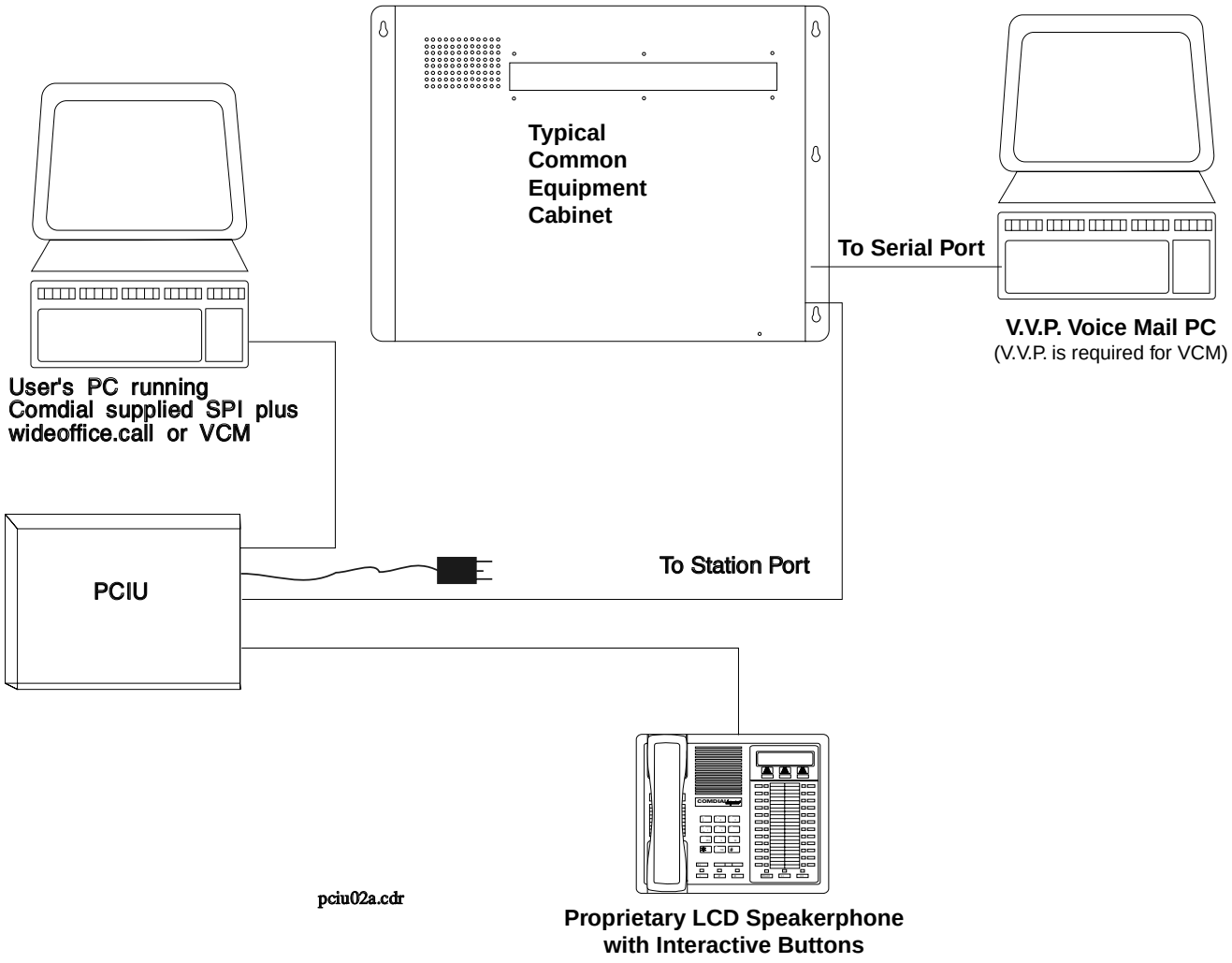
System Requirements

VCM	Minimum Requirements for Specific Systems				
	DSU	DSU II	DXP	DXP Plus	V.V.P.
System Software	18A	2A	11B	11B	8.2
Digital Station Board Firmware	not required	not required	Rev 5	Rev 5	not required
Available Serial Port	required	required	required	required	required

wideopen.call	Minimum Requirements for Specific System			
	DSU	DSU II	DXP	DXP Plus
System Software	18A	2A	8A	3A

Available Product Codes

Comdial Product Code	Product Description
PCIU–WOC–01	one PCIU and wideopen.call software
PCIU–WOC–06	six PCIUs and wideopen.call software
PCIU–VCM–01	one PCIU with VCM software
PCIU–VCM–06	six PCIUs with VCM software
PCIU–PK1	wideopen.call software for PCIU
PCIU–PK2	VCM software for PCIU



Reviewing The PCIU Concept

Installing The PCIU

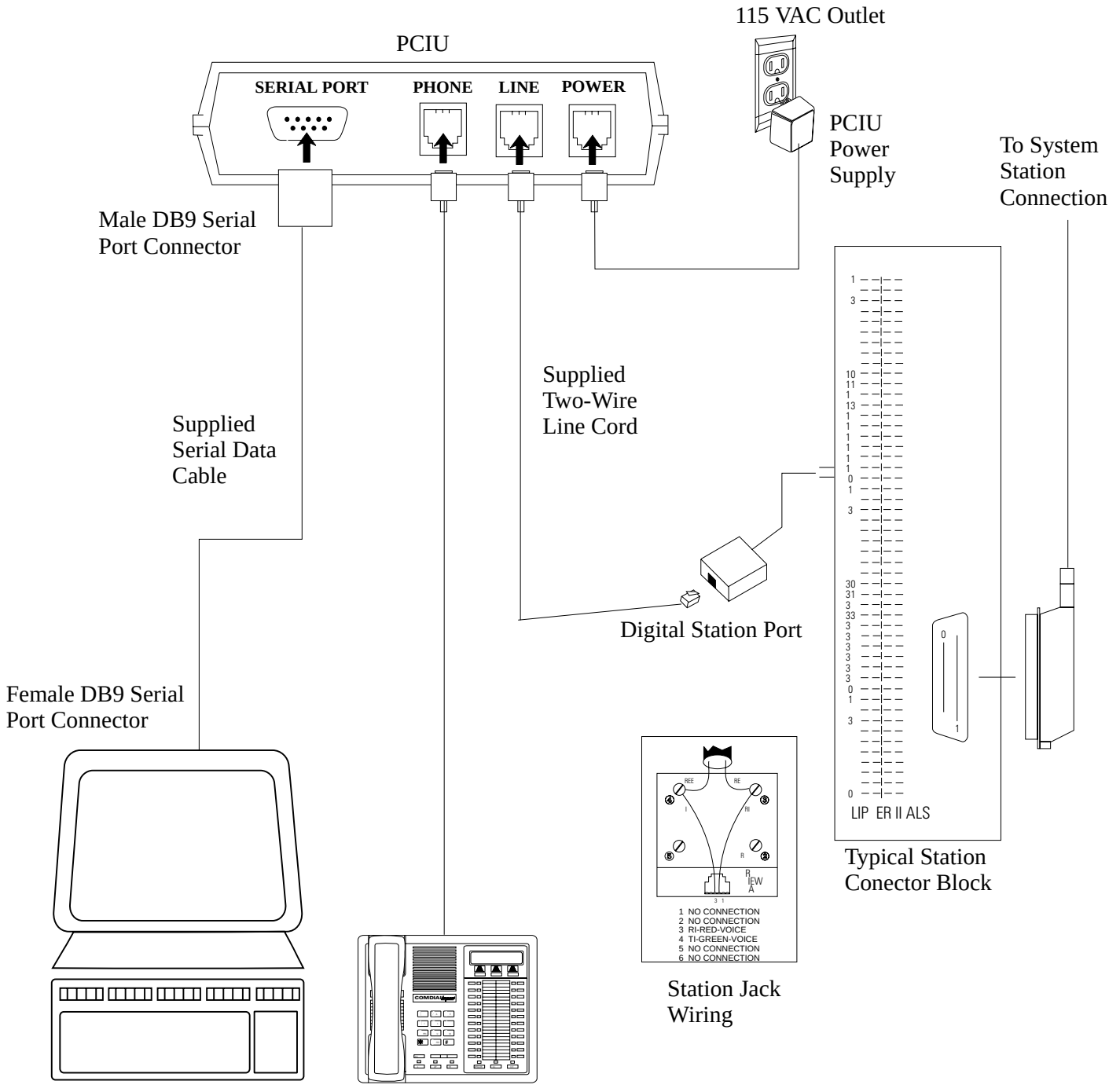
Connect the PCIU between a digital station port and that port's proprietary digital speakerphone and also to a user-supplied PC. The PCIU includes Service Provider Interface (SPI) software that you must load on the user-supplied PC. The SPI software, in conjunction with the wideopen.call or VCM software, allows the PCIU to use the serial data path between it and the user-supplied PC to send messages to the PC and to the telephone's display. Complete instructions for installing the SPI software are detailed in the paragraph titled, *Installing The Telephony Driver*.

Making The Cable Connections

Four cable connections are required to the PCIU—station line cord, digital telephone line cord, PC cable, and power cable.

1. Disconnect the digital LCD speakerphone's line cord from the digital station port connector,and plug it into the connector labeled PHONE on the PCIU.
2. Connect the supplied serial data cable between the PC's serial data port (COM port) and the PCIU's serial port connector. (A 9-pin to 9-pin cable is supplied with the PCIU. If you are using a 25-pin serial port on the PC, you must use a 9-to-25 pin adapter.)
3. Plug one end of a standard line cord into the connector labeled LINE on the PCIU. Plug the other end of the line cord into the digital station port connector.
4. Plug the transformer attached to one end of the power cable into a 115 VAC electrical wall outlet. Connect the other end of the power cable into the PCIU connector labeled POWER. The green LED on the PCIU turns on to indicate that power is being supplied to the PCIU.

NOTE: PCIU power loss will create the same symptoms as the disconnection of the PCIU from the digital telephone system. If this occurs, plug the digital telephone directly into a digital station port connector.



4

Making The Cable Connections

Installing The Telephony Driver

After you have physically connected the PCIU to your PC, you must install the SPI software that runs the PCIU device.

To install the telephony driver using Windows 95,

1. Click on the **Start** button in the lower left corner of the screen.
   Go to **Settings** and select **Control Panel**.
2. Double click on the **Telephony** icon located in the Control Panel dialog. (If your computer does not display the Telephony icon, refer to the section titled, *Installing The Telephony Icon*.)
   The Telephony Properties dialog appears.
3. Click the **Add...** button.
   The Add Driver dialog appears.
4. Select Unlisted or Updated Driver and click the **Add...** button.
   The Insert Disk dialog appears.
5. Insert the service provider disk and type the appropriate drive letter in the Insert Disk dialog.
   Click the **OK** button. The Add Unlisted Or Updated Driver dialog appears.
6. Select **Comdial PCIU SPI** and click **OK**.
   (If the Driver Exists dialog appears, click **New** to install a new driver.)
7. When the telephony driver installation is complete, the Telephony Properties dialog will appear. The computer will display Comdial PCIU TAPI Service Provider in the list in addition to Unimodem Service Provider. (Do not remove the Unimodem Service Provider.)
8. Click on **Setup** in the Telephony Properties dialog. Select your system type and com port from the drop-down lists.
9. Click the **Query Start** button.
10. The computer now configures itself according to your telephone's settings.
    Do not use your telephone while the computer is configuring itself.
    (Any time you change settings on your telephone, you must update your computer's configuration by running Query mode again. To run Query mode, go to the Telephony Properties dialog, click **Setup**, and click **Query Start**.)

To install the telephony driver using Windows 3.11,

1. From the Main dialog, double click on the **Control Panel** icon.
   The Control Panel dialog appears.
2. Double click on the **Telephony** icon. (If your computer does not display the Telephony icon, refer to the section titled, *Installing The Telephony Icon*.)
   The Telephony dialog appears.
3. Click the **Driver Setup** button.
   The Telephony Drivers dialog appears.
4. Select **Add**.
   The Add Driver dialog appears.
5. Select unlisted or updated driver and click **Add**.
   The Insert Disk dialog appears.
6. Insert the service provider disk and type the appropriate drive letter in the Insert Disk dialog.
   Click the **OK** button. The Add Unlisted Or Updated Driver dialog appears.
7. Select **Comdial PCIU SPI** and click **OK**.
   (If the Driver Exists dialog appears, click **New** to install a new driver.)
8. When the telephony driver installation is complete, the Telephony Properties dialog will appear. The computer will display Comdial PCIU TAPI Service Provider in the list.
9. Click on **Driver Setup** in the Telephony Properties dialog. Select the system type and com port from the drop-down lists.
10. Click the **Query Start** button.
11. The computer now configures itself according to your telephone's settings.
    Do not use your telephone while the computer is configuring itself.
    (Any time you change settings on your telephone, you must update your computer's configuration by running Query mode again. To run Query mode, go to the Telephony Properties dialog, click **Driver Setup**, and click **Query Start**.)

Installing The Telephony Icon

If your computer does not display the telephony icon in the Control Panel dialog, use the following procedure to add the telephony icon.

To add the telephony icon in Windows 95,

1. Click on the **Start** button in the lower left corner of the screen. Go to **Programs** and select **Windows Explorer**.
2. Double click on the letter of your hard drive (usually C:).
3. Double click on the word **Windows** in the directory list.
4. Double click on the word **System** in the directory list.
5. On the right side of the screen, find the file named **Telephon.cp$** and click on it.
6. From the **File** drop down menu, select **Rename**.
   An editing box appears around the file name Telephon.cp$.
7. Delete the "$" at the end of the file name and replace it with an "l" so that the file's name is now Telephon.cpl.

NOTE: The replacement entry for step 7 is the lower case alphabet letter l not the numeric digit 1.

8. Exit Windows Explorer by selecting **Close** from the File drop down menu.
9. The Telephony icon should now appear in the Control Panel dialog.

To add the telephony icon in Windows 3.11

1. Insert the Distribution Disk in the floppy drive.
2. From the Main Window, select **File Manager**.
3. Click on the letter of the floppy drive containing the Distribution Disk.
4. A list of the the files on the Distribution Disk appears.
   Select the file named **Telephon.cpl** from the list.
5. From the File drop down menu, select **Copy**.
   The Copy dialog appears.
6. In the **To:** box enter **c:\windows\system**.
7. To copy the help file, repeat steps 4–6.
   Make sure you select the help file **telephon.hlp** in step 4.
8. Click **OK**.
9. The Telephony icon should now appear in the Control Panel dialog.

COMDIAL®

Installing And Programming Small Office And Versatile Voice Processing Voice Mail Systems On DXP, DXP Plus, And FX Series Digital Communications Systems

This installation and programming instruction gives you information for integrating the Versatile Voice Processing (VVP) voice mail system with the various digital communications systems.

The introductory section familiarizes you with the VVP option. The remaining sections explain VVP installation details through the various station boards and Comdial-produced interface devices, and details the programming requirements needed for complete VVP integration. The following list shows the section titles of this publication:

- Understanding the VVP Option
- Installing The VVP At Analog Station Ports
- Installing The VVP At Digital Station Ports
- Installing the VVP At Industry-Standard Station Ports
- Programming For VVP Operation

Understanding The VVP Option

The VVP voice mail system provides special voice messaging services to system telephone users. They can immediately use this system without any training because it prompts them with easy-to-understand instructions. VVP also provides an automatic attendant feature that automatically answers any line that is ringing at a voice mail port. Further, it provides an immediate transfer to a voice mail box if you make the proper programming arrangements. You can also program the system to alert a busy telephone that the VVP system is attempting to transfer a call to it instead of having the VVP system automatically route that call to a voice mail box.

The VVP system interfaces with the station ports through Comdial-produced interface devices. The particular device used depends upon whether the digital communications system provides analog or digital station ports for use. For analog station ports, use the Voice Mail Interface device (VMI–X) or Off-Premise Extension device (OPX–X). For digital station ports, use the Analog Terminal Interface (ATI–D–1PT). The digital communications system can also provide industry-standard telephone (IST) station ports if you have equipped it with IST station boards to do so. When an IST port is available for VVP use, you do not need to install an external interface device between the VVP system and the IST station ports. Regardless of whether you use a VMI–X, an OPX–X, an ATI–D–1PT or an industry-standard station board, never bridge an industry-standard telephone across the VVP system. Such a connection will prevent the VVP system from working properly.

To insure that the system works properly with the VVP system, you must perform several programming functions after you have connected the hardware together. Refer to Section 5 for complete programming details.

NOTE: While this instruction details the installation and programming details necessary to interface the VVP equipment to the digital communications system's common equipment cabinet, you must also refer to the literature that accompanies the VVP hardware to understand how to install and program the VVP equipment.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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Installing The VVP System At Analog Station Ports

When you interface the VVP system to the digital communications system through the analog station ports on its analog station board, you must place the Comdial Voice Mail Interface device (VMI–X) or Off Premise Extension device (OPX–X) between the VVP ports and the system's station ports. both the VMI–X and OPX–X devices include two circuits; therefore, **you will need one device for every two VVP ports that you plan to connect. This means that for a four-port VVP system, you will need two devices.**

The device has its own power supply that connects to the AC power line.

Installing The VMI–X Or OPX–X Device

Be sure the mounting location is secure and dry, has adequate ventilation, and is a large enough area to allow easy placement of the device. The temperature range of the location must be within 32 - 90° F (0 - 40° C).

Be sure that you have the following tools and hardware available:

- Fasteners, such as 1/4-inch wood screws, of a sufficient length to securely bite into mounting backboard
- Cross Recessed screwdriver (phillips-head type)
- Flat-blade Screwdriver
- Electric Drill if prepared holes are needed
- Connecting tool—for fastening wires to a type-66 connector block.
- Crimping tool—for 623-type modular plugs.

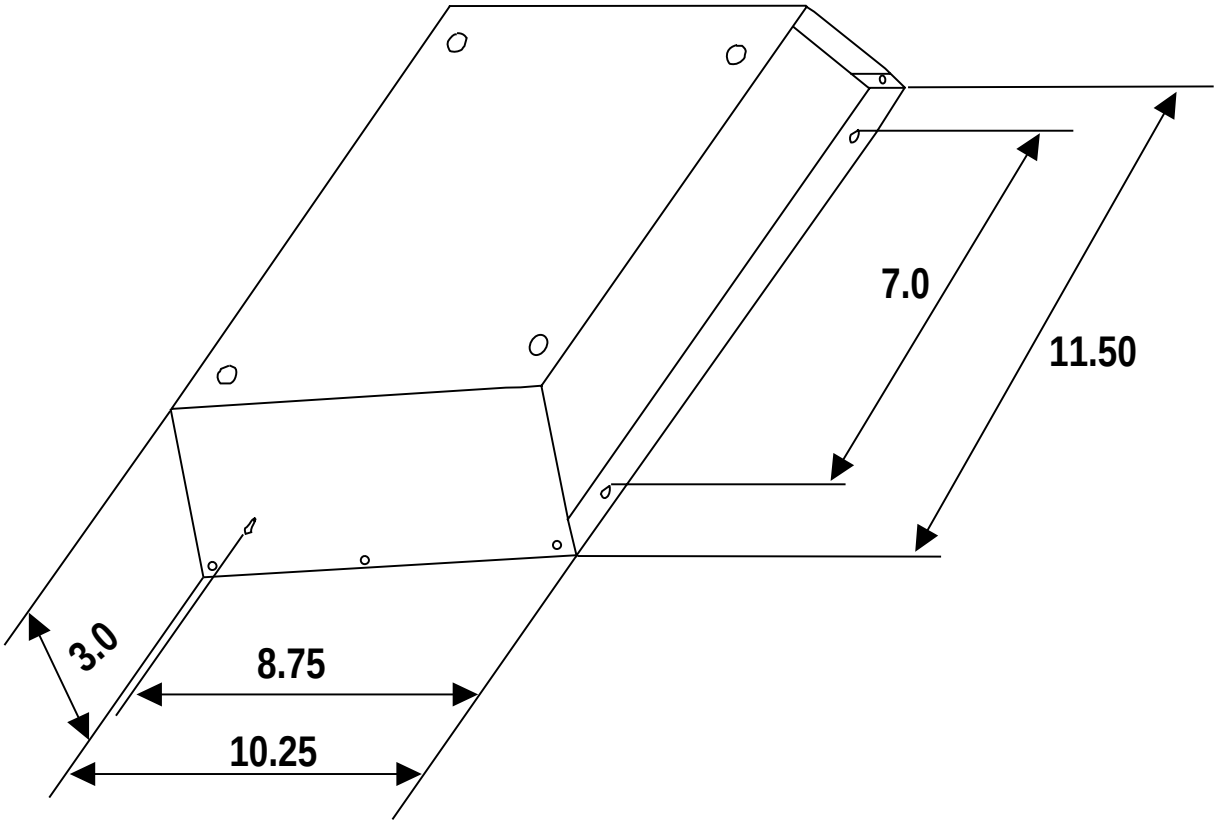
1. Unpack, and carefully inspect the device for shipping damage. Notify the shipper immediately of any damages found. Verify that the package contains all parts and accessories needed for proper installation and operation.
2. Locate the device within 25 feet of both the common equipment cabinet and the VVP system.
3. If a backboard is required at the mounting location, attach it securely to provide a stable mounting surface.
4. Use the base of the device cabinet as a template or measure for mounting hole locations per the dimensions shown in the outline dimensions drawing located on the next page.
5. Drill holes of a proper size to accommodate the hardware being used into the mounting surface. If necessary, prepare these holes with inserts, anchors or other attachment devices as dictated by the type of mounting surface.
6. Insert the screws into the mounting surface and tighten them to within approximately 1/8-inch of the surface.
7. Hang the device cabinet on the screws using the mounting holes located on the rear of the cabinet. Note that these holes are elongated with an enlargement at one end. This feature allows the cabinet to snap down on the screws to secure the mounting when the cabinet is hung on them.

Setting The Configuration Switches

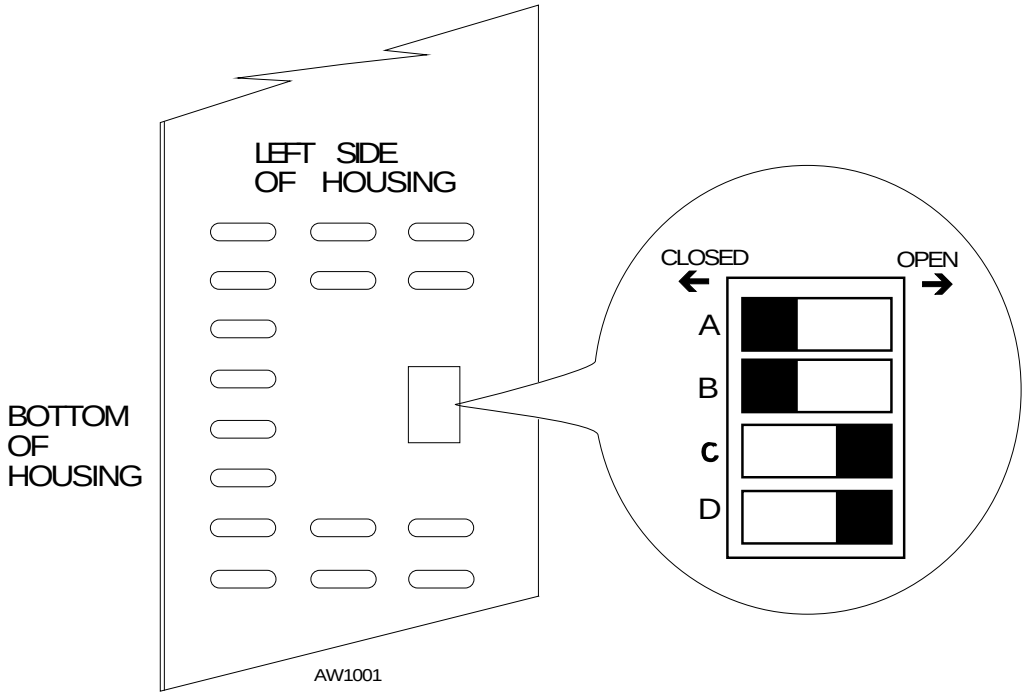
Set the configuration switches that are located on the left side of the device housing to match the digital communications system and VVP system. Refer to the illustration shown on the next page and set the switches as detailed on this table.

Switch	Setting
A	Closed
B	Closed
C	Open
D	Open

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Detailing The VMI–X And OPX–X Dimensions



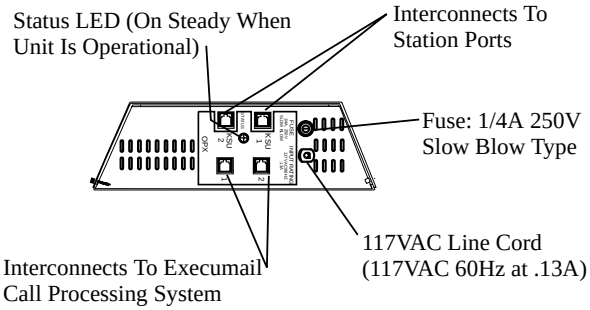
Setting The VMI–X And OPX–X Configuration Switches

Connecting The VMI–X Or OPX–X Device

- Route the necessary cabling, and connect the device between the VVP system and the station ports per the connections detailed in the diagram shown on the next page.
  - Use two-pair (four-wire) cable between the station port connection block and the device.
  - Use one-pair (two-wire) cable for each device termination jack.
  - Use two-pair (four-wire) cable between the VVP system and the device termination jack.
- The device requires a grounding wire that is separate from the third-wire AC line cord ground. It provides a ground stud on the left side of its housing for this purpose. Connect a #10 or #12, insulated, solid copper wire between this ground stud and either to the ground stud on the digital communications system common equipment cabinet or to a reliable earth ground.
- Plug the AC line cord for the device interface into a 115 VAC outlet. Observe the status light on the unit, and insure that it turns on steady.
- Inspect the wiring to verify that you have connected it properly.

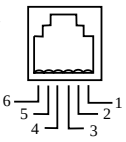
CAUTION

Do not connect an industry-standard telephone in parallel with (bridged across) the VVP equipment on the industry-standard side of the device. Such a connection will cause the VVP equipment to operate improperly.

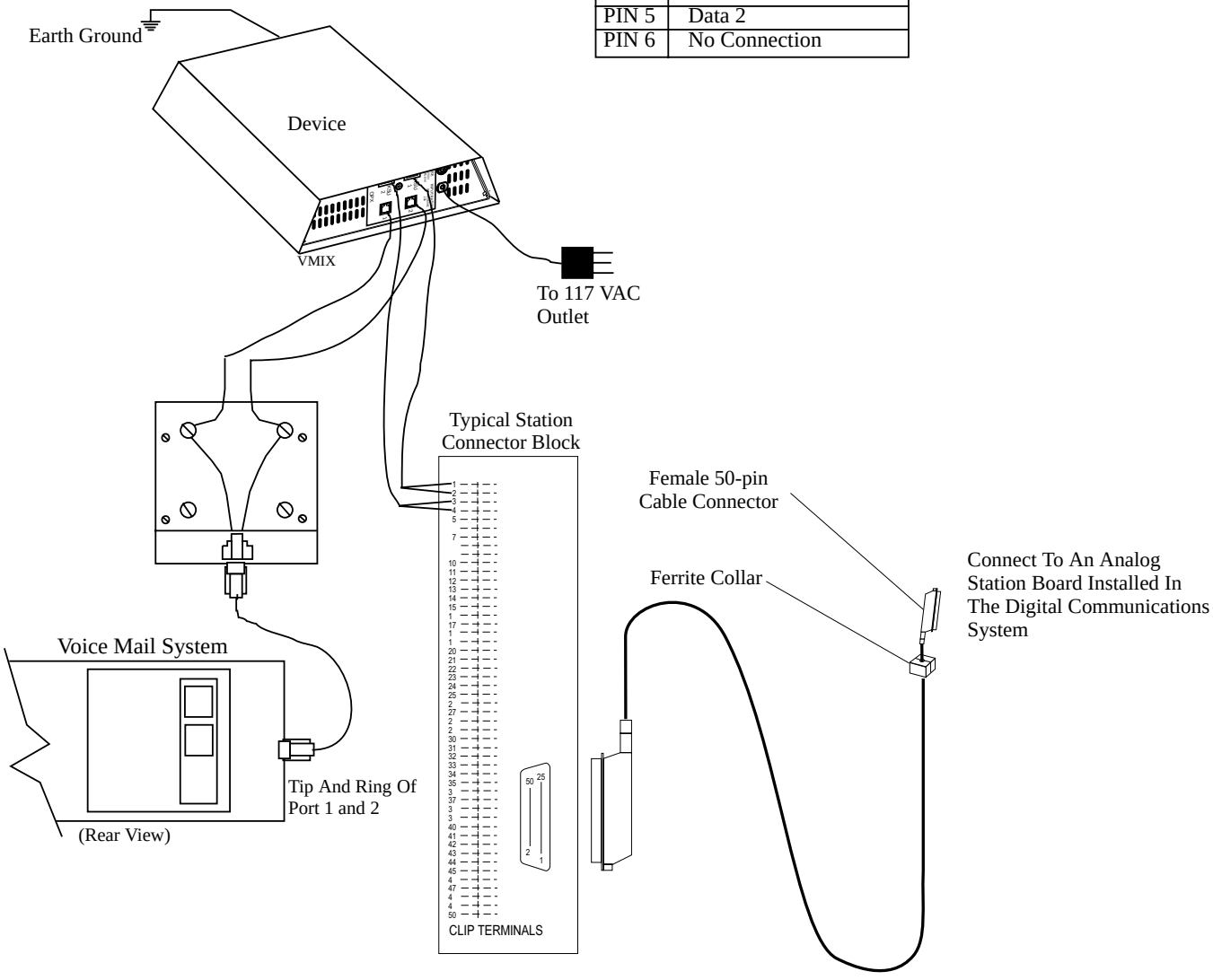

Status LED (On Steady When Unit Is Operational)
Interconnects To Station Ports
Fuse: 1/4A 250V Slow Blow Type
117VAC Line Cord (117VAC 60Hz at .13A)
Interconnects To Execumail Call Processing System

Line Jack	
PIN 1	No Connection
PIN 2	Tip 2
PIN 3	Ring 1
PIN 4	Tip 1
PIN 5	Ring 2
PIN 6	No Connection

PIN Locations On Jacks - Front View



Common Equipment Jack	
PIN 1	No Connection
PIN 2	Data 1
PIN 3	Voice 1
PIN 4	Voice 2
PIN 5	Data 2
PIN 6	No Connection



Interconnecting The VMI–X Or OPX–X Device

Installing The VVP System At Digital Station Ports

When you interface the VVP system to the digital communications system through its digital station ports, you must place the Analog Terminal Interface Device (ATI–D–1PT) between the two systems. The ATI-D-1PT includes one circuit; therefore, **you will need a separate device for every VVP port that you plan to connect. This means that for a four-port VVP system, you will need four ATI–D–1PT devices.** The ATI–D–1PT is powered through its station port connections.

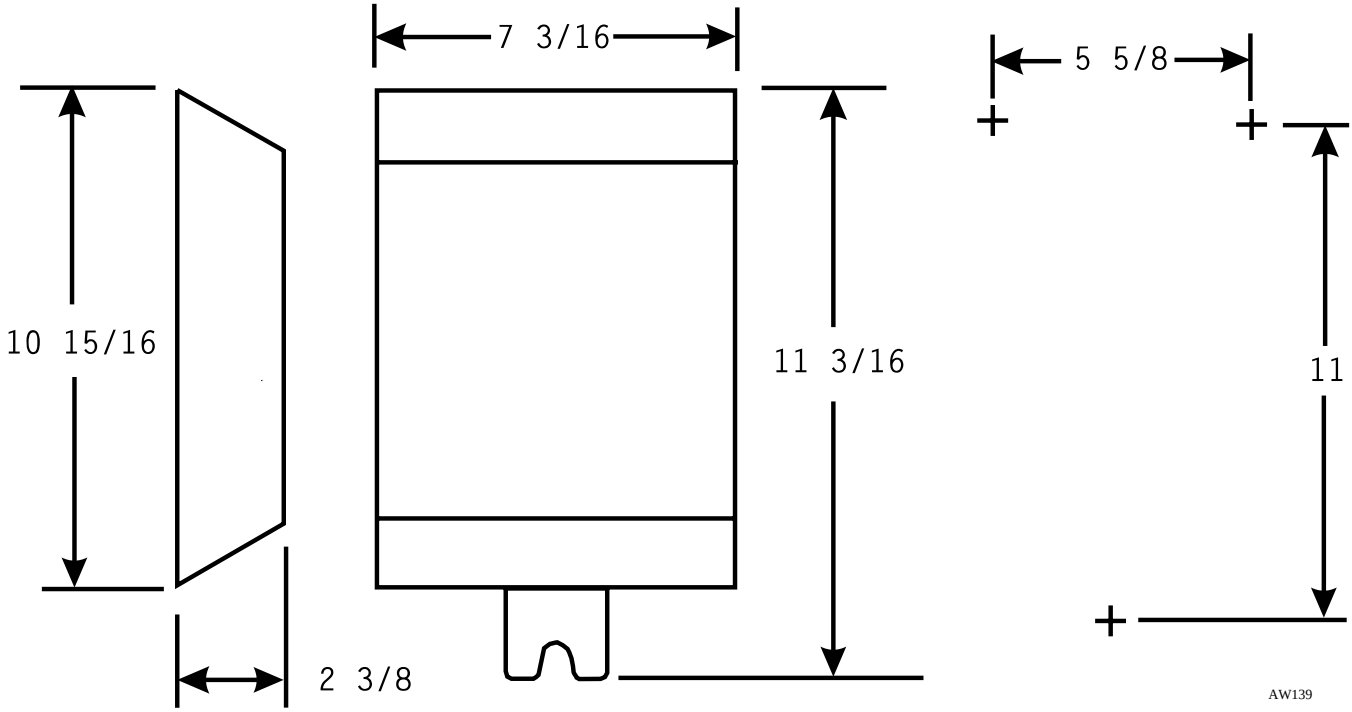
Installing The ATI-D-1PT

Be sure the mounting location is secure and dry, has adequate ventilation, and is a large enough area to allow easy placement of the ATI–D–1PT. The temperature range of the location must be within 32 - 90° F (0 - 40° C).

Be sure that you have the following tools and hardware available for mounting the ATI–D–1PT:

- Fasteners, such as 1/4-inch wood screws, of a sufficient length to securely bite into mounting backboard
- Cross Recessed screwdriver (phillips-head type)
- Flat-blade Screwdriver
- Electric Drill if prepared holes are needed
- Connecting tool—for fastening wires to a type-66 connector block.
- Crimping tool—for 623-type modular plugs.

1. Unpack, and carefully inspect the ATI–D–1PT for shipping damage. Notify the shipper immediately of any damages found. Verify that the package contains all parts and accessories needed for proper installation and operation.
2. Locate the device within 25 feet of both the common equipment cabinet and the VVP system.
3. If a backboard is required at the mounting location, attach it securely to provide a stable mounting surface.
4. Use the base of the ATI–D–1PT cabinet as a template or measure for mounting hole locations per the dimension details shown in the outline dimensions drawing located on the next page.
5. Drill holes of a proper size to accommodate the hardware being used into the mounting surface. If necessary, prepare these holes with inserts, anchors or other attachment devices as dictated by the type of mounting surface.
6. Insert the two top screws into the mounting surface and tighten them to within approximately 1/8-inch of the surface.
7. Hang the ATI–D–1PT cabinet on the top screws using the mounting holes located on the rear of the cabinet. Note that these holes are elongated with an enlargement at one end. This feature allows the cabinet to snap down on the screws to secure the mounting when the cabinet is hung on them.
8. Insert a third screw through the mounting tab located on the lower edge of the cabinet and into the mounting surface; tighten it into place.



Outline Dimensions
(In Inches)

Spacing For
Mounting Hardware
(In Inches)

Detailing The ATI–D–1PT Dimensions

Connecting the ATI-D-1PT

- Route the necessary cabling, and connect the ATI–D–1PT device between the VVP system and the digital station ports per the connections detailed in the diagram shown on the next page.
  - Use one-pair (two-wire) cable for all connections.

CAUTION

Be careful when connecting the wiring between the Plus and the ATI–D–1PT. Be sure to connect the digital station port to the COMMON EQUIPMENT jack on the ATI–D–1PT. Damage to the ATI–D–1PT could occur if you mistakenly connect to the IST jack.

- A grounding wire is not required for operation; however, one is desirable for decreasing radio frequency interference and electrostatic discharge susceptibility. The ATI–D–1PT provides a ground stud on its housing for this purpose. Connect a #10 or #12, insulated, solid copper wire between this ground stud and either to the ground stud on the digital communications system common equipment cabinet or to a reliable earth ground.
- Inspect the wiring to verify that you have connected it properly.

CAUTION

Do not connect an industry-standard telephone in parallel with (bridged across) the VVP equipment on the industry-standard side of the ATI–D–1PT. Such a connection will cause the VVP equipment to operate improperly.

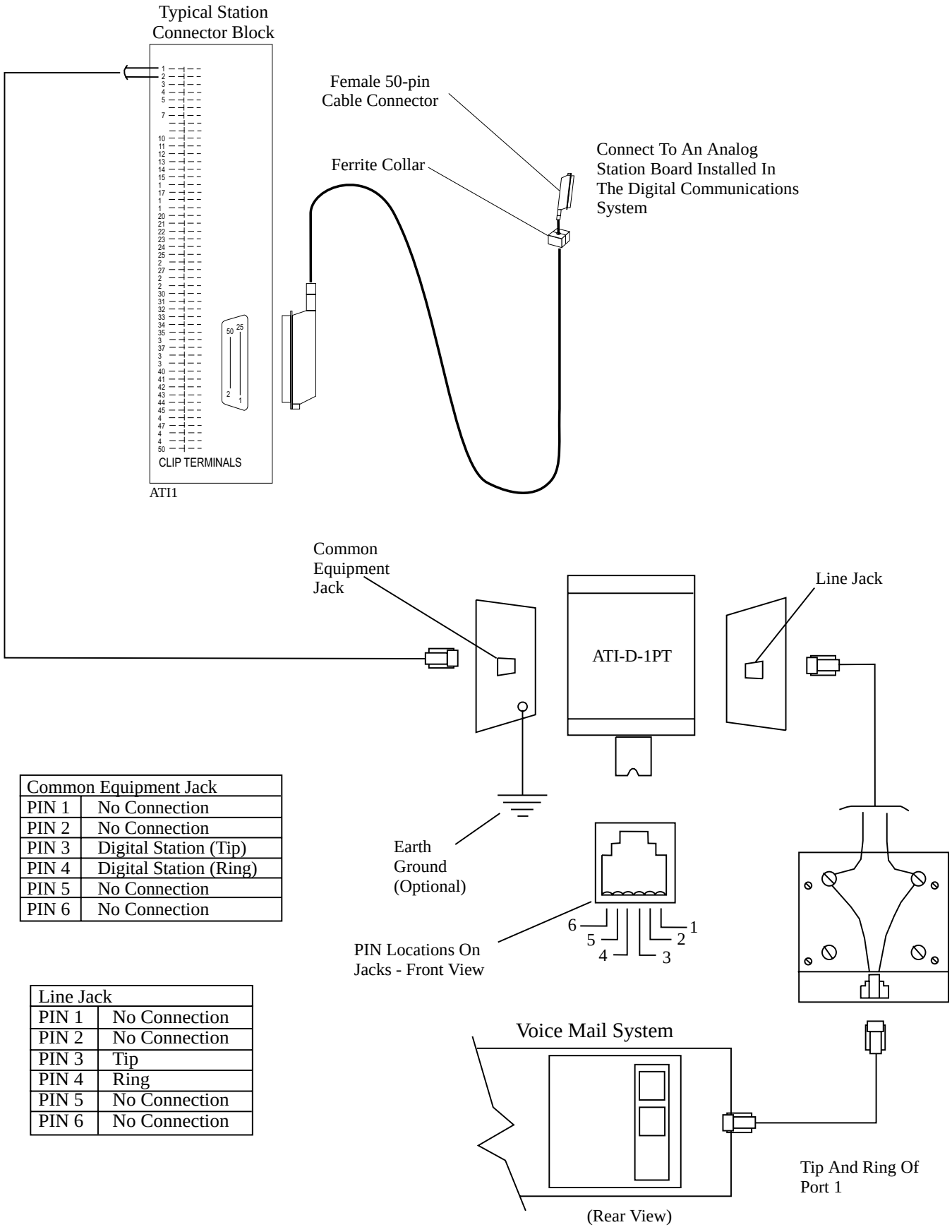
Verifying Proper ATI–D–1PT Connection

Use a voltmeter to check for the presence of voltage on the ATI–D–1PT IST jack.

1. Be sure wiring between ATI-D-1PT and common equipment station ports is installed.
2. Measure for DC voltage on IST jack:
   - Measure between TIP leads and grounding stud on digital communications system common equipment cabinet.
   - Measure between RING leads and grounding stud on the digital communications system common equipment cabinet.
   - Measure between TIP leads and RING leads.

   The measured voltages must be within the limits detailed on the following table.

Measurement	Voltage
Tip to Ground	– 1 to + 1 VDC
Ring to Ground	– 27 to – 38 VDC
Tip to Ring	+ 28 to + 37 VDC
The TIP lead is positive with respect to the RING lead.	



Common Equipment Jack	
PIN 1	No Connection
PIN 2	No Connection
PIN 3	Digital Station (Tip)
PIN 4	Digital Station (Ring)
PIN 5	No Connection
PIN 6	No Connection

Line Jack	
PIN 1	No Connection
PIN 2	No Connection
PIN 3	Tip
PIN 4	Ring
PIN 5	No Connection
PIN 6	No Connection

Interconnecting The ATI–D–1PT

Installing The VVP System At IST Station Ports

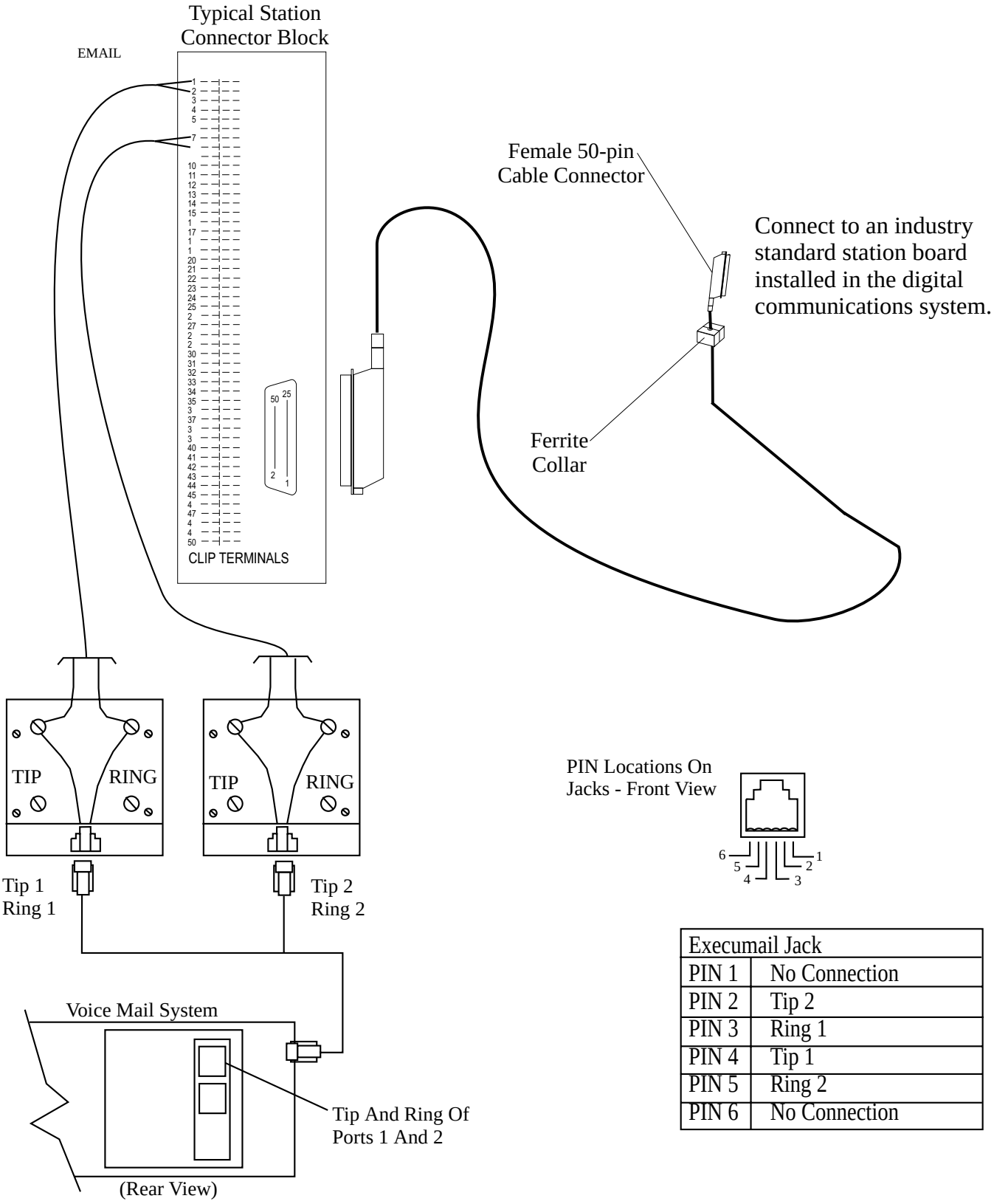
When you interface the VVP system to the digital communications system through the industry-standard telephone station ports on its industry-standard station board, you do not need an interface device; however, **you will need a station port for every VVP port that you plan to connect. This means that for a four-port VVP system, you will need four IST station ports.**

Connecting the VVP System

- Route the necessary cabling, and connect the VVP ports to the IST station ports per the connections detailed in the diagram shown on the next page.
  - Use one-pair (two-wire) cable for all connections.
- Inspect the wiring to verify that you have connected it properly.

NOTE: Insure that the digital communications system provides an adequate supply of DTMF receivers. There should be at least one DTMF receiver for each voice mail port. This requirement is in addition to any DTMF receivers that the digital communications system must supply to support system IST stations.

Insure that the digital communications system includes a ring generator in each equipment cabinet that includes an IST station board. (The FX Series digital communications system includea a ring generator as part of its IST station board; therefore, with the FX Series system, there is no requirement for an external ring generator.)



Execumail Jack	
PIN 1	No Connection
PIN 2	Tip 2
PIN 3	Ring 1
PIN 4	Tip 1
PIN 5	Ring 2
PIN 6	No Connection

Interconnecting VVP Directly To System

Providing Visual Voice Mail Support

Visual Voice Mail (VVM) support provides proprietary, two-line display LCD speakerphone stations with visual messages and interactive buttons. This message and button functionality enhances the station's use of VVP.

VVM causes the speakerphone to display a **VMAIL** interactive button that users press to call the voice mail system. After they press this button, the system prompts them to enter a password. (This password is one that the programmer of the voice mail system assigns to the stations.) Once users enter the password, the speakerphone's display shows the VVP's main menu. From there, users can select the operation they wish to pursue.

When messages await, the display shows the message quantity in place of the VMAIL button (for example, **5 MSG**). Users press this **MSG** button to cause the VVP system to play the stored messages. The system prompts the user to enter a password (if programmed to require one) before it plays the new messages.

Installing The Visual Voice Mail

To make visual voice mail (VVM) operational, you must connect the personal computer (PC) that is running the VVP voice mail program to the digital communications system's serial data port. Refer to the technical literature that supports the particular digital communications system involved for serial data port availability.

The distance between the PC and the common equipment cabinet can be up to 500 feet in a quiet electrical environment, however, some sites may require shielded cable for long runs. For longer distances, you must install limited distance modems to relay the data communications between the common equipment and a data device.

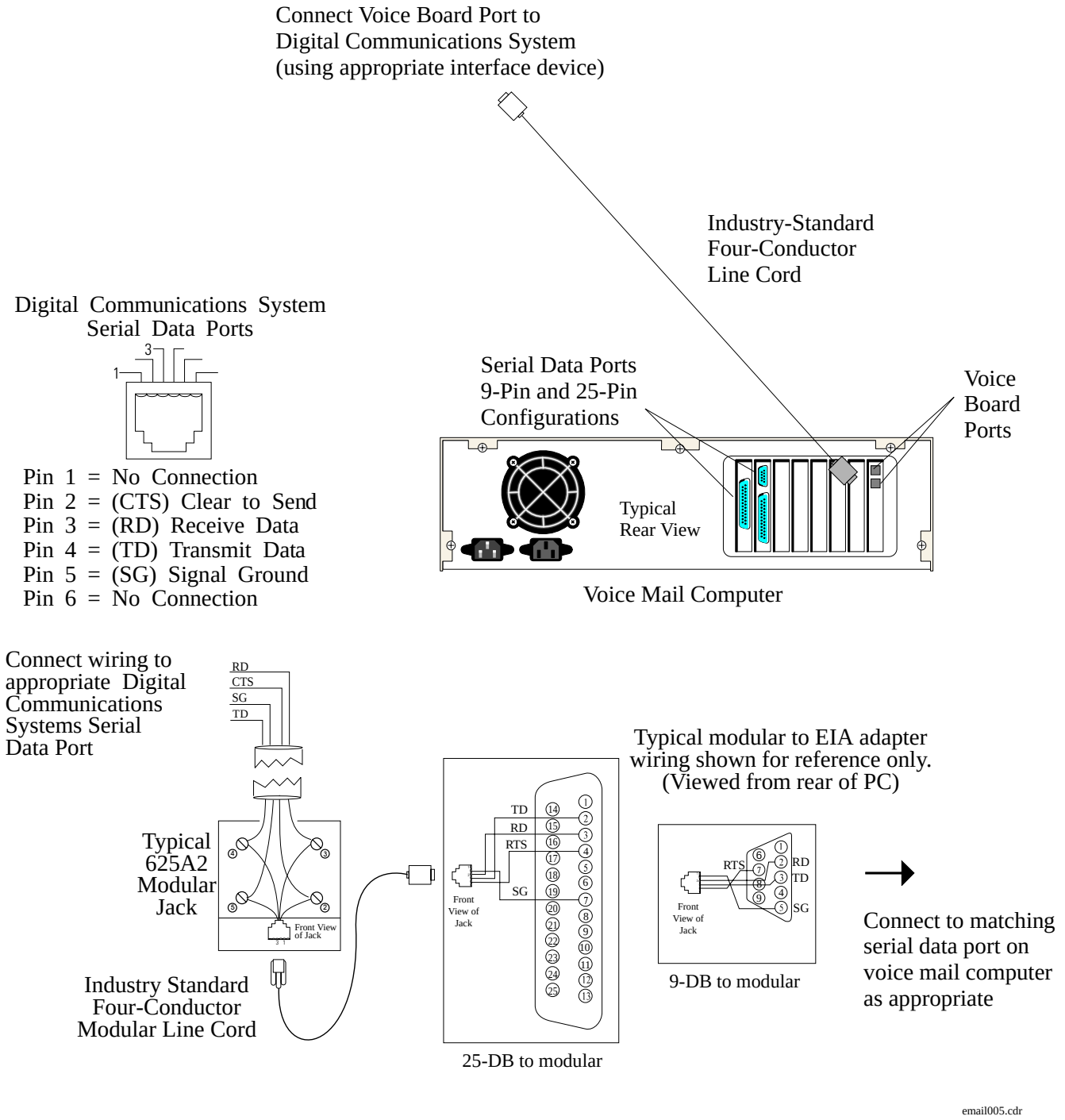
When preparing a cable for connection to a PC, refer to the manufacturer's manual and for connection details, and make the following wiring connections:

- Wire the common equipment RD (data from PC to common equipment) connection to the PC's TD (transmit data) connection.
- Wire the common equipment TD (data to PC from common equipment) connection to the PC's RD (receive data) connection.
- Wire the common equipment SG (signal ground) connection to the PC's SG (signal ground) connection.
- Wire the common equipment CTS (clear-to-send status from device to common equipment) connection to the PC's RTS (request-to-send) connection.

NOTE: The common equipment requires a positive voltage, with respect to signal ground, in order to send data.

Configure the PC to match the the common equipment's default data format for initial operation or reprogram the digital telephone system's data format to match those of the PC. The default data communications format is as follows:

- 8 data bits, 1 stop bit, no parity, and with a baud rate of 9600 baud



Wiring The VVP Connections

Programming For Voice Mail Operation

After connecting a VVP voice mail system to the digital communications system, program the digital communications system to operate properly with VVP by setting the features detailed in this section.

Arranging Station Ports For Voice Mail Use

After you have connected voice mail ports to the system station ports through the appropriate interface devices (for example, the VMI-X interface device used with analog station ports, the ATI-D-1PT interface device used with the digital station ports, or the industry standard telephone station board used with industry-standard telephone ports). Use the station programming menu to identify the station ports where these devices are connected.

Assigning Intercom Numbers To Voice Mail Connections

You must identify the station intercom number of each voice mail connection and link these numbers together to form a circular hunt group for call handling purposes. For example, assign intercom numbers 121, 122, 123, and 124 to voice mail ports 1, 2, 3, and 4 then link 121 to 122, 122 to 123, 123 to 124, and 124 to 121. Use the voice mail programming menu to make this programming choice.

HINT: To make the LCD readouts at the system telephones more descriptive during call transfers, assign a descriptive name to the personal intercom numbers. If you do this, be sure to name each voice mail port differently. For instance, you can name them VM1, VM2, VM3, and VM4; however, do not name each port VM without personalizing it further with a unique suffix (such as 1, 2, 3, 4 or A, B, C, D for example).

Arranging Voice Mail Call Transfer Parameters

Automatic Attendant Transfer On Busy

You can enable automatic attendant transfer on busy for individual station ports if you wish. With this feature enabled, the system will ring a busy telephone when the voice mail system is attempting to transfer a call to it thus giving the user the option of leaving his or her present call and taking the new one. With the feature disabled, the busy telephone is not signalled by the presence of a new call, and voice mail will automatically route the call to the busy telephone's voice mail box. Use the station programming menu to set this feature choice.

Immediate Transfer

You could choose the automatic attendant immediate transfer mode for voice mail transfers. It allows the voice mail system to transfer a call as soon as it answers. However, if you turn on the voice mail's screen and confirm options (see the voice mail programming manual for details), do not turn on the immediate transfer mode. Immediate transfer is a system-wide parameter and affects all telephones in the system. Use the system parameters menu to make this programming choice.

Assigning Special-Purpose Buttons For Voice Mail Use

Transfer-To-Voice Mail Button

A system user can use a pre-programmed button to transfer an incoming call directly to a voice mail box so the caller can leave a message. You must use the station programming button mapping menu to assign this Transfer-To-Voice Mail button at a system telephone.

*NOTE: Enter **XVM** and a two-digit code (0–32) that equals one of the voice mail ports. Usually, you will enter the code for the first voice mail port and let the extension number linking (that you have previously arranged) decide which voice mail port actually handles the call. However if you have arranged voice mail ports into groups for department answering, enter the voice mail port code for the group that also includes the telephone that you are button mapping.*

Arranging Voice Mail Ringing Options

Direct, Delayed, Or Night Ringing

The digital communications system automatically enables ringing line preference at the voice mail station ports. With this feature enabled, the voice mail system's automatic attendant will answer calls. You can use direct, delayed, or night ringing features to determine how quickly or when it does this. With direct ringing, calls ring at the voice mail port immediately. With delayed ringing, the calls wait before ringing the voice mail port. This gives you the flexibility of having calls direct ring at a telephone where they can be answered by a human operator before they delay ring and the automated attendant answers them.

You need only to assign ringing to the first voice mail port because the remaining voice mail ports are hunt-linked to the first port and calls will ring at the first available port. However, if ringing is assigned to the other voice mail ports, you must enter the following line of data when you program the VVP system's digit translation section:
TRANS.TXT file: 1=9990

Program ringing assignments for the digital communications system from the ringing assignments menu located under the stations/station programming headings.

Ringing Line Preference

With ringing line preference, a voice mail port can automatically connect to a ringing line when it goes off-hook. program the ringing line preference from the Station/Station COS programming menu.

Ring–No Answer

You can set the number of rings that sound at one station port before the call rolls to the next port. Any system feature that requires a ring–no answer value, such as call forwarding, uses this setting. The system defaults the ring–no answer value to three rings for voice mail ports to insure that the VVP voice mail system has time to answer a call before the call rolls to the next voice mail port.

Assigning Voice Mail Identification (ID) Number

As an option, you can assign an identification number to each line so that the voice mail system can provide customized call handling on a per line basis. Use voice mail system programming to match this ID number to a particular personal directory or transaction box within the voice mail system. When the digital communications system routes a call that is ringing at a particular line to the voice mail system to be answered, it routes it with the ID number. The voice mail system then sends the call to the box that corresponds to the line's ID number. You can use voice mail system programming to construct customized answering prompts for the individual boxes. This allows the IDed lines to be answered in a customized manner by the voice mail system's automatic attendant.

Assign a voice mail ID to a line using the line type specific menu located under the line programming/line attributes heading.

Activating Through Dialing *(Thru-Dialing)*

This procedure allows DTMF tones that are generated by voice mail system to pass through the digital communications system and out to any line connection. This feature is automatically enabled when you assign a station to the voice mail list. Program this feature from the stations/station programming/options menu.

Enabling Extended DTMF Tones For Voice Mail Use

The system provides a means by which you can set the length of the DTMF tones that it generates when a user dials a number from his or her telephone. Since the voice mail system may require a different DTMF tone length than that which you have provided for the telephones, the system provides a means for you to set a separate DTMF tone length for voice mail station ports. It defaults the length to 80 msec, but you can program other lengths as needed. Extend DTMF tones with choices that you make from the system/call timing menu.

Enabling Message Wait Originate Feature

When you enable this feature, a station user can dial a feature code to control the message waiting light at another station. You must enable this feature for voice mail ports. Use station/station COS programming menu to set this feature.

Enabling Disconnect Supervision

When you enable this feature, the system detects any break in the loop current anytime it occurs during an outside call. Set this feature from the lines/line programming/line type specific menu.

Setting The Voice Mail Integration Digits

You can choose the DTMF digits that the digital communications system sends to a voice mail system to signal call progress information. A voice mail system uses this DTMF signaling to determine system and station status so that it can properly process a call. You must be versed in your voice mail's requirements before you can accurately assign DTMF integration digits; however, the digital communications system defaults the voice mail parameters to match the VVP voice mail system. Use the voice mail/integration digits menu to program the choices for these items.

Follow Extension ID

When the voice mail system receives a forwarded call from a ring no-answer (RNA) or busy station, the digital communications system sends to the voice mail system the extension number of the forwarded call followed by this DTMF digit. The digital communications system sends this digit within 500 ms of the time the voice mail system answers the call. For example, if extension 101 is forwarded to voice mail and voice mail answers a forward RNA or busy forwarded call, the sends 101n to the voice mail system within 500 ms of the answer time. The VVP voice mail system requires a value of **2**.

Intercom/Answer Confirmation

The digital communications system sends this DTMF digit to the voice mail system to confirm that an intercom path (without dial tone) is available for the voice mail system's call transfer or dialing use. The digital communications system sends this digit within 500 ms of the time it detects the voice mail system's off-hook or hookflash condition. The digital communications system also immediately sends this digit to the voice mail system when a station answers a voice mail transferred call. This action can alert the voice mail system to disconnect and leave the parties connected. The VVP voice mail system requires a value of **1**.

Busy

If the voice mail system transfers a call to a station that is busy on a call, the digital communications system sends this DTMF digit to the voice system. When the voice mail system receives this digit, it can abandon the transfer, reconnect to the call, and offer the caller whatever options the the voice mail system has available in its programming. If the auto attendant transfer on busy feature is active, the digital communications system will not send the DTMF digit to the voice mail system thus allowing the voice mail system to transfer a second call to the station. The VVP voice mail system requires a value of **2**.

DND

If the voice mail system transfers a call to a station that is in the do not disturb (DND) mode, the digital communications system sends this DTMF digit to the voice system. Receiving this digit allows the voice mail system to distinguish between a busy and a DND condition and offer the caller the appropriate choices. The VVP voice mail system requires a value of **3**.

Incoming Intercom Answer

The digital communications system sends this DTMF digit to the voice mail system when a station user makes an intercom call to the voice mail system. This action allows the voice mail system to distinguish between internal and external calls and offer the caller appropriate prompts and dialing options. The VVP voice mail system requires a value of **9**.

Disconnect

When an outside line or intercom party hangs up, the digital communications system sends this DTMF digit to the voice mail system to command an immediate disconnect. For outside calls, the central office (CO) must provide disconnect supervision to the digital communications system and you must program the line for abandon hold release and disconnect supervision. At default, the digital communications system sends the DTMF tone for the **A** character as the disconnect digit. Since a caller cannot dial an **A** from a telephone, this feature eliminates callers from causing an accidental disconnect by dialing this digit on their telephone's dial pad.

Logon

The telephone system transmits the logon digit to the VVP voice mail system along with the station extension number whenever a station calls the VVP voice mail system and finds that the voice mail system has no messages for that station. The VVP voice mail system requires a value of **9**.

Logon With Messages

The telephone system transmits the logon with messages digit to the VVP voice mail system along with the station extension number whenever a station calls the VVP voice mail system and finds that the voice mail system does have messages for that station. The VVP voice mail system requires a value of **8**.

Ringing

The telephone system transmits the ringing digit to the VVP voice mail system when the voice mail system is calling a station and that station is ringing. The VVP voice mail system requires a value of **4**.

Invalid Extension

The telephone system transmits the invalid extension digit to the VVP voice mail system when the voice mail system has dialed an invalid extension while attempting to call a station. The VVP voice mail system requires a value of **5**.

Signaling Abandon Hold Release

When a distant party abandons a hold condition and his or her station disconnects from the line, the central office sends a forward disconnect signal to the system. This signal is either 50 or 350 msec. in length. Use this procedure to program the line port to match the central office signal length. Set this feature from the lines/line programming/line type specific menu.

Arranging VVP Programming To Match The Digital Communications System

The VVP software contains default configuration for integration with Comdial digital communications systems. The following settings are those default values. Unless otherwise noted, do not change these settings without consulting with a Comdial technical services technician.

1. The VM.CFG file contains the following lines:

   HOST = IB,COMDIAL
   CUSTOM = 32768
   CP.DIALTONE = 1
   CP.ANS = 1
   CP.BUSy = 2
   CP.DND = 3
   TRANS ByPASS = ✻
   CP.RING = 4
   CP.INVALID = 5

2. The TRANS.TXT file contains the following lines:

   Systems with 4 digit extensions
   8XXXX=XXXX✻,#,&,9
   9XXXX=XXXX✻,#
   #XXXX=#,XXXX
   XXXX2=XXXX✻,✻
   XXXXS=XXXX✻,✻

   Systems with 3 digit extensions
   8XXXX=XXXX✻,#,&,9
   9XXXX=XXXX✻,#
   #XXX=#, XXX
   XXX2=XXX✻,✻
   XXXS=XXX✻,✻

3 The Rhetorex CONFIG file contains the following line:
   INPUTGAIN=800

4. Call Transfer Options (System Information menu)
   “Detect Dial Tone?” and “Detect Call-progress Tones?’ must be set to yES.
   ”Transfer Bypass Digit" must be set to LAST.

5. Technical Information (System Information Menu)
   “Disconnect Digit Sequence’ must be set to A.”
   “Pause Length” must be set to 2000

6. Other Customizations (system Information Menu)
   “Initial Pause” should be set to 1. This field may be adjusted if necessary. One “Custom” field must be set to 512.

7. Mailboxes (box Menu)
   In prototype (mailbox 9994) and sample mailboxes, the “Message Waiting Lamp” sequences must be set to the following:
   Turn On = Serial
   Turn Off = Serial

Using The Tracker Paging System With VVP Voice Mail

The Tracker paging system is available for use with the digital communications system and in conjunction with VVP. To make effective use of the Tracker paging system, to program two mail boxes for each Tracker pager user. VVp uses the first mail box to deposit regular voice mail messages and the second mail box to park the caller and track the called person. The VVP will give callers an opportunity *to press 3 for other options*. When they do so, VVP sends the call to the second box to be placed in a park orbit while Tracker pages the called party.

To arrange for this feature, take the following VVP programming action for the two voice mail boxes:

For the regular voice mail box,

1. Leave the Pager Number field blank.
2. Set the Pager Type to None.
3. In the If caller chooses other options field select *Go to box.*
4. In the Box field enter a box number, which will be defined as the paging box, in the following procedure.

For the paging voice mail box, define the box number in a way that it can be linked to the regular mail box. It should not be the number of another extension or mail box. For example, precede the mail box number with a 7 for all pager boxes.

1. Select *Blind Transfer Type.*
2. Enter ✳8 plus the mail box number in the *Transfer To* entry line
3. Record a name for this box such as, Tracker for Joe Smith or Paging Joe Smith.

Using the Tracker for Message Notification

The Tracker can indicate to a mail box owner that new messages are in his or her mail box. It uses the Message Delivery field for this function. To enable this feature, enter ✳8,X in the Message Delivery field for all mail box owners with a Tracker.

COMDIAL®

Installing And Programming ExecuMail Equipment On The DXP Digital Communications System

This installation instruction gives you information for connecting the ExecuMail voice processing system to the DXP digital communications system.

The introductory section familiarizes you with the ExecuMail option and the literature supplied with it. The remaining sections explain ExecuMail installation details through the various station boards and Comdial-produced interface devices. The following list shows the section titles of this publication:

- 1.0 Understanding the ExecuMail Option
- 2.0 Installing The ExecuMail At Analog Station Ports
- 3.0 Installing The ExecuMail At Digital Station Ports
- 4.0 Installing the ExecuMail At Industry-Standard Station Ports
- 5.0 Programming For ExecuMail Operation

1.0 Understanding The ExecuMail Option

The ExecuMail voice processing system provides special voice messaging services to system telephone users. They can immediately use this system without any training because it prompts them with easy-to-understand instructions. ExecuMail also provides an automatic attendant feature that automatically answers any line that is ringing at a voice mail port. Further, it provides an immediate transfer to a voice mail box if you make the proper programming arrangements. You can also program the system to alert a busy telephone that the ExecuMail system is attempting to transfer a call to it instead of having the ExecuMail system automatically route that call to a voice mail box.

The ExecuMail system interfaces with the station ports through Comdial-produced interface devices. The particular device used depends upon whether the DXP provides analog or digital station ports for use. For analog station ports, use the Voice Mail Interface device (VMI–X). For digital station ports, use the Analog Terminal Interface (ATI–D–1PT). The DXP can also provide industry-standard telephone (IST) station ports if you have equipped it with IST station boards to do so. When an IST port is available for ExecuMail use, you do not need to install an external interface device between the ExecuMail system and the DXP IST station ports. Regardless of whether you use a VMI–X, an ATI–D–1PT or an industry-standard station board, never bridge an industry-standard telephone across the ExecuMail system. Such a connection will prevent the ExecuMail system from working properly.

To insure that the DXP system works properly with the ExecuMail system, you must perform several programming functions after you have connected the hardware together. Refer to Section 5 for complete programming details.

While the remainder of this instruction details the installation steps necessary to interface the ExecuMail equipment to the DXP equipment, you must also refer to the literature that accompanies the ExecuMail hardware to understand how to install and program the ExecuMail equipment.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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2.0 Installing The ExecuMail System At Analog Station Ports

When you interface the ExecuMail system to the DXP system through the analog station ports on its analog station board, you must place the Comdial Voice Mail Interface device (VMI–X) between the ExecuMail ports and the system's station ports. The VMI–X includes two circuits; therefore, **you will need one device for every two ExecuMail ports that you plan to connect. This means that for a four-port ExecuMail system, you will need two VMI–X devices.**

The VMI–X device has its own power supply that connects to the AC power line.

2.1 Installing The VMI–X

Be sure the mounting location is secure and dry, has adequate ventilation, and is a large enough area to allow easy placement of the VMI-X. The temperature range of the location must be within 32 - 90° F (0 - 40° C).

Be sure that you have the following tools and hardware available for mounting the VMI–X:

- Fasteners, such as 1/4-inch wood screws, of a sufficient length to securely bite into mounting backboard
- Cross Recessed screwdriver (phillips-head type)
- Flat-blade Screwdriver
- Electric Drill if prepared holes are needed
- Connecting tool—for fastening wires to a type-66 connector block.
- Crimping tool—for 623-type modular plugs.

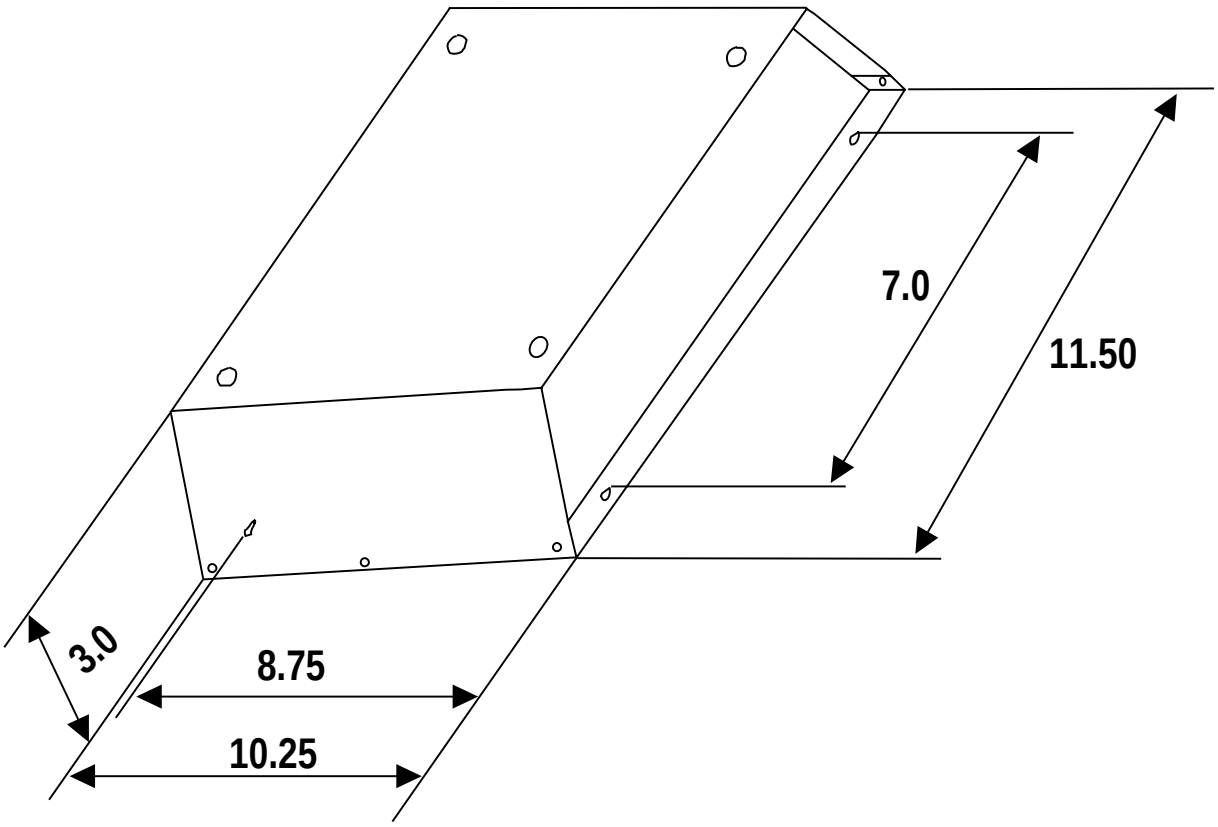
1. Unpack, and carefully inspect the VMI–X for shipping damage. Notify the shipper immediately of any damages found. Verify that the package contains all parts and accessories needed for proper installation and operation.
2. Locate the VMI–X device within 25 feet of both the common equipment cabinet and the ExecuMail system.
3. If a backboard is required at the mounting location, attach it securely to provide a stable mounting surface.
4. Use the base of the VMI–X cabinet as a template or measure for mounting hole locations per the dimensions shown in the outline dimensions drawing located on the next page.
5. Drill holes of a proper size to accommodate the hardware being used into the mounting surface. If necessary, prepare these holes with inserts, anchors or other attachment devices as dictated by the type of mounting surface.
6. Insert the screws into the mounting surface and tighten them to within approximately 1/8-inch of the surface.
7. Hang the VMI–X cabinet on the screws using the mounting holes located on the rear of the cabinet. Note that these holes are elongated with an enlargement at one end. This feature allows the cabinet to snap down on the screws to secure the mounting when the cabinet is hung on them.

2.2 Setting The Configuration Switches

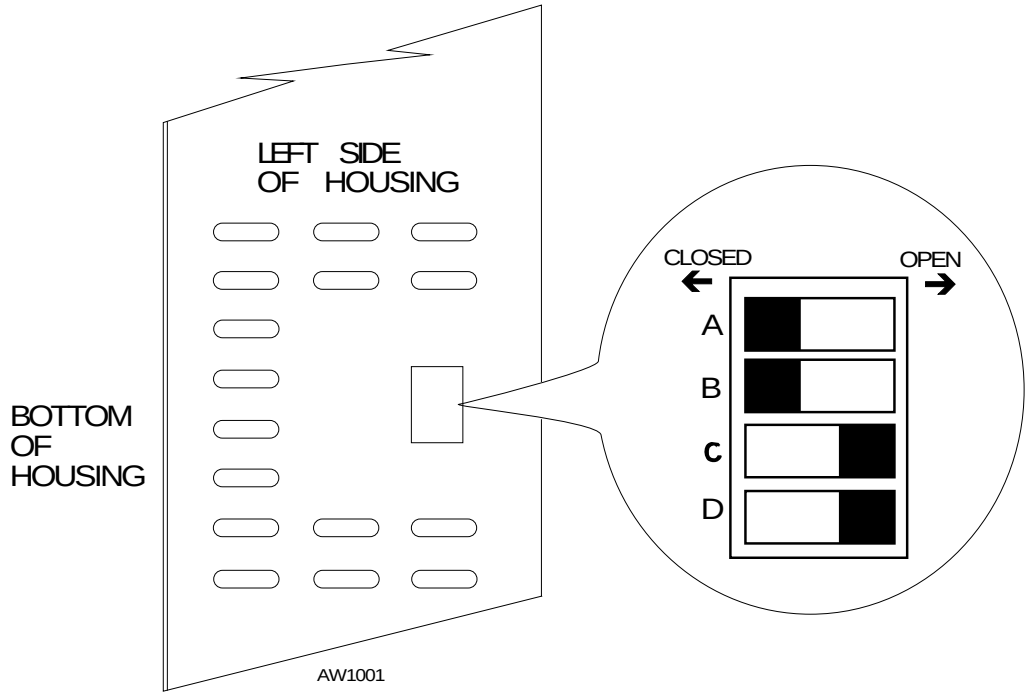
Set the configuration switches that are located on the left side of the VMI–X housing to match the DXP and ExecuMail systems. Refer to the illustration shown on the next page and set the switches as detailed on this table.

Switch	Setting
A	Closed
B	Closed
C	Open
D	Open

AW1002



Detailing The VMI–X Dimensions



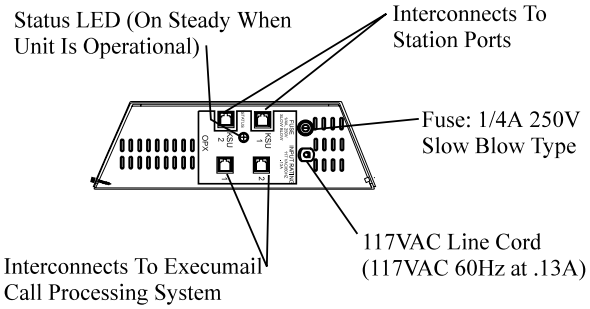
Setting The VMI–X Configuration Switches

2.3 Connecting the VMI–X

- Route the necessary cabling, and connect the VMI–X device between the ExecuMail system and the station ports per the connections detailed in the diagram shown on the next page.
  - Use two-pair (four-wire) cable between the station port connection block and the VMI–X device.
  - Use one-pair (two-wire) cable for each VMI–X termination jack.
  - Use two-pair (four-wire) cable between the ExecuMail system and the VMI–X termination jack.
- The VMI–X requires a grounding wire that is separate from the third-wire AC line cord ground. It provides a ground stud on the left side of its housing for this purpose. Connect a #10 or #12, insulated, solid copper wire between this ground stud and either to the ground stud on the digital communications system common equipment cabinet or to a reliable earth ground.
- Plug the AC line cord for the VMI–X interface into a 120 VAC outlet. Observe the status light on the unit, and insure that it turns on steady.
- Inspect the wiring to verify that you have connected it properly.

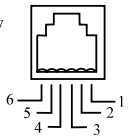
CAUTION

Do not connect an industry-standard telephone in parallel with (bridged across) the ExecuMail equipment on the industry-standard side of the VMI–X. Such a connection will cause the ExecuMail equipment to operate improperly.

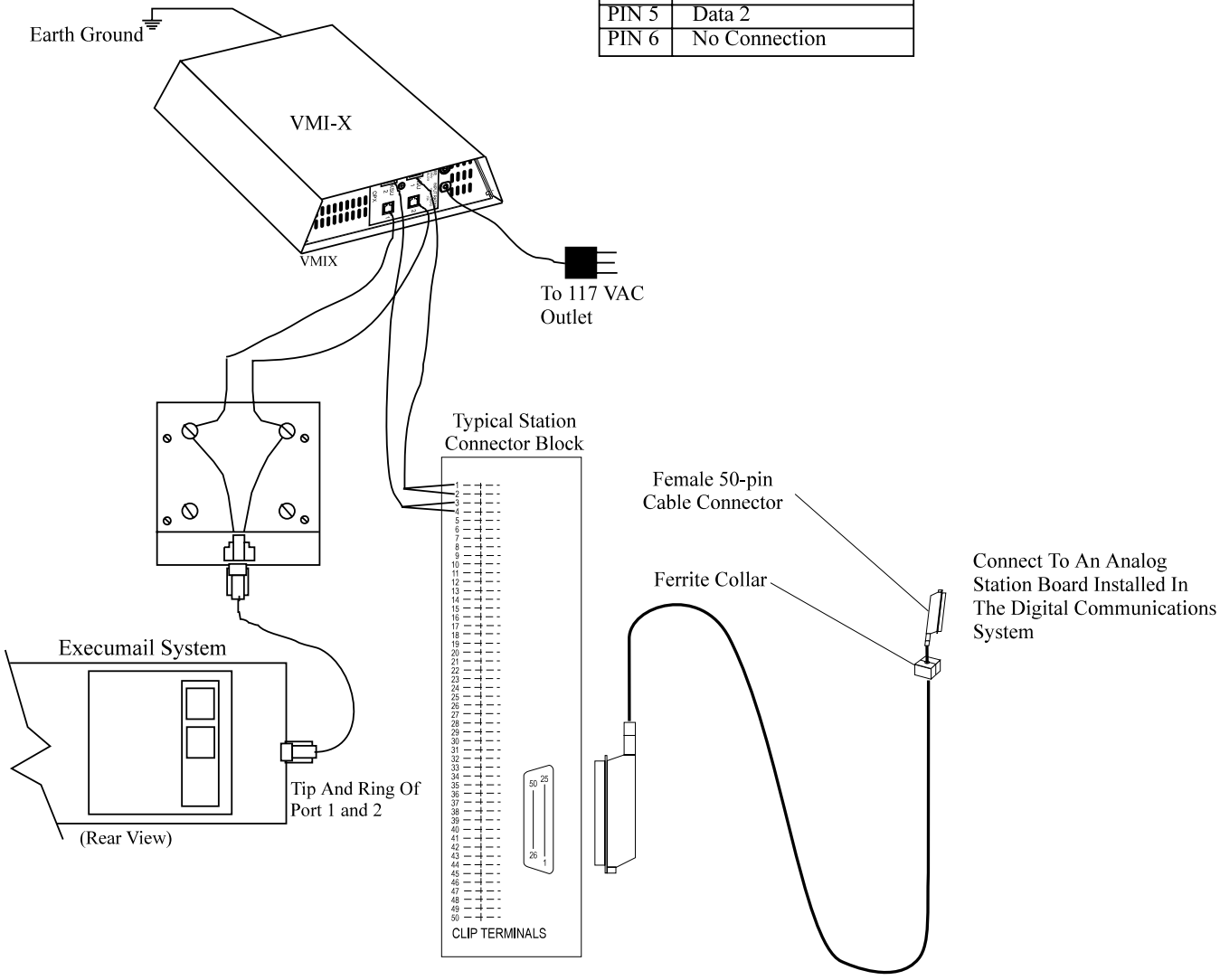

Status LED (On Steady When Unit Is Operational)
Interconnects To Station Ports
Fuse: 1/4A 250V Slow Blow Type
117VAC Line Cord (117VAC 60Hz at .13A)
Interconnects To Execumail Call Processing System

Line Jack	
PIN 1	No Connection
PIN 2	Tip 2
PIN 3	Ring 1
PIN 4	Tip 1
PIN 5	Ring 2
PIN 6	No Connection

PIN Locations On Jacks - Front View



Common Equipment Jack	
PIN 1	No Connection
PIN 2	Data 1
PIN 3	Voice 1
PIN 4	Voice 2
PIN 5	Data 2
PIN 6	No Connection



Interconnecting The VMI–X

3.0 Installing The ExecuMail System At Digital Station Ports

When you interface the ExecuMail system to the DXP system through its digital station ports, you must place the Analog Terminal Interface Device (ATI–D–1PT) between the two systems. The ATI-D-1PT includes one circuit; therefore, **you will need a separate device for every ExecuMail port that you plan to connect. This means that for a four-port ExecuMail system, you will need four ATI–D–1PT devices.** The ATI–D–1PT is powered through its station port connections.

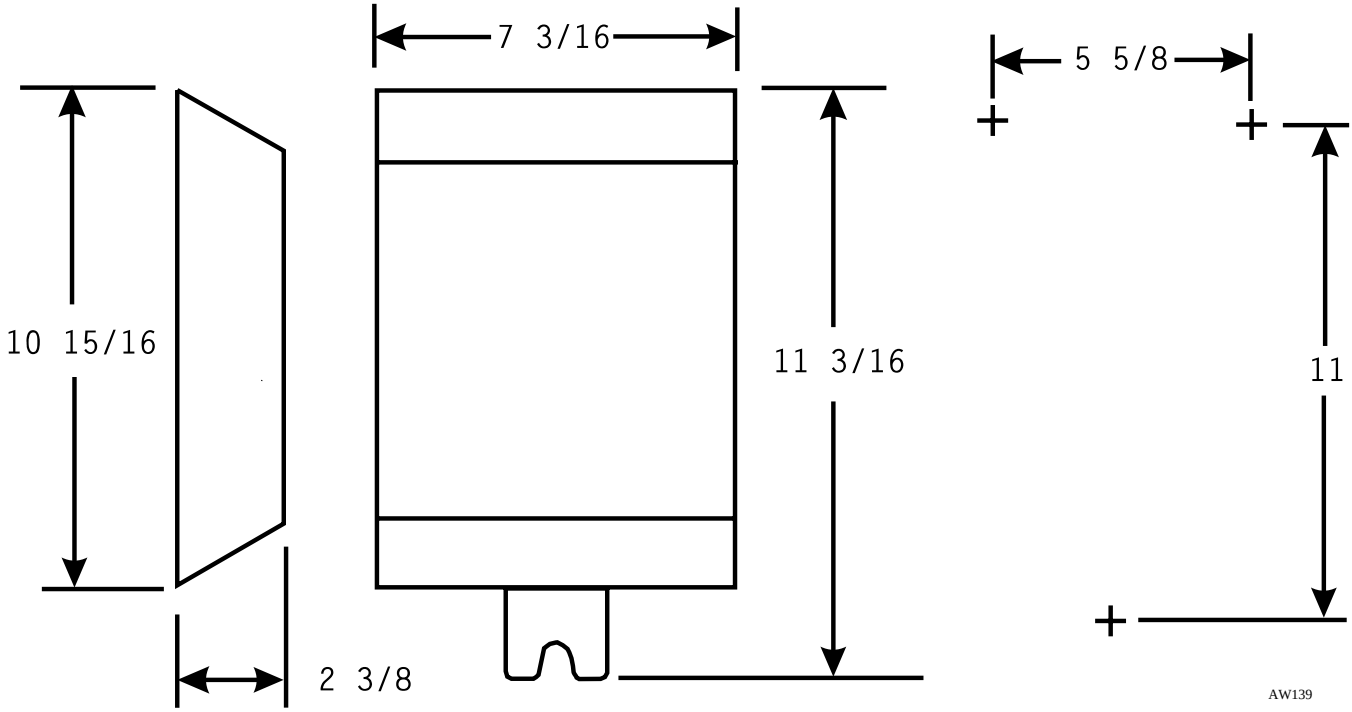
3.1 Installing The ATI-D-1PT

Be sure the mounting location is secure and dry, has adequate ventilation, and is a large enough area to allow easy placement of the ATI–D–1PT. The temperature range of the location must be within 32 - 90° F (0 - 40° C).

Be sure that you have the following tools and hardware available for mounting the ATI–D–1PT:

- Fasteners, such as 1/4-inch wood screws, of a sufficient length to securely bite into mounting backboard
- Cross Recessed screwdriver (phillips-head type)
- Flat-blade Screwdriver
- Electric Drill if prepared holes are needed
- Connecting tool—for fastening wires to a type-66 connector block.
- Crimping tool—for 623-type modular plugs.

1. Unpack, and carefully inspect the ATI–D–1PT for shipping damage. Notify the shipper immediately of any damages found. Verify that the package contains all parts and accessories needed for proper installation and operation.
2. Locate the device within 25 feet of both the common equipment cabinet and the ExecuMail system.
3. If a backboard is required at the mounting location, attach it securely to provide a stable mounting surface.
4. Use the base of the ATI–D–1PT cabinet as a template or measure for mounting hole locations per the dimension details shown in the outline dimensions drawing located on the next page.
5. Drill holes of a proper size to accommodate the hardware being used into the mounting surface. If necessary, prepare these holes with inserts, anchors or other attachment devices as dictated by the type of mounting surface.
6. Insert the two top screws into the mounting surface and tighten them to within approximately 1/8-inch of the surface.
7. Hang the ATI–D–1PT cabinet on the top screws using the mounting holes located on the rear of the cabinet. Note that these holes are elongated with an enlargement at one end. This feature allows the cabinet to snap down on the screws to secure the mounting when the cabinet is hung on them.
8. Insert a third screw through the mounting tab located on the lower edge of the cabinet and into the mounting surface; tighten it into place.



Outline Dimensions
(In Inches)

Spacing For
Mounting Hardware
(In Inches)

Detailing The ATI–D–1PT Dimensions

3.1 Connecting the ATI-D-1PT

- Route the necessary cabling, and connect the ATI–D–1PT device between the ExecuMail system and the digital station ports per the connections detailed in the diagram shown on the next page.
  - Use one-pair (two-wire) cable for all connections.

CAUTION

Be careful when connecting the wiring between the DXP Plus and the ATI–D–1PT. Be sure to connect the digital station port to the COMMON EQUIPMENT jack on the ATI–D–1PT. Damage to the ATI–D–1PT could occur if you mistakenly connect to the IST jack.

- A grounding wire is not required for operation; however, one is desirable for decreasing radio frequency interference and electrostatic discharge susceptibility. The ATI–D–1PT provides a ground stud on its housing for this purpose. Connect a #10 or #12, insulated, solid copper wire between this ground stud and either to the ground stud on the digital communications system common equipment cabinet or to a reliable earth ground.
- Inspect the wiring to verify that you have connected it properly.

CAUTION

Do not connect an industry-standard telephone in parallel with (bridged across) the ExecuMail equipment on the industry-standard side of the ATI–D–1PT. Such a connection will cause the ExecuMail equipment to operate improperly.

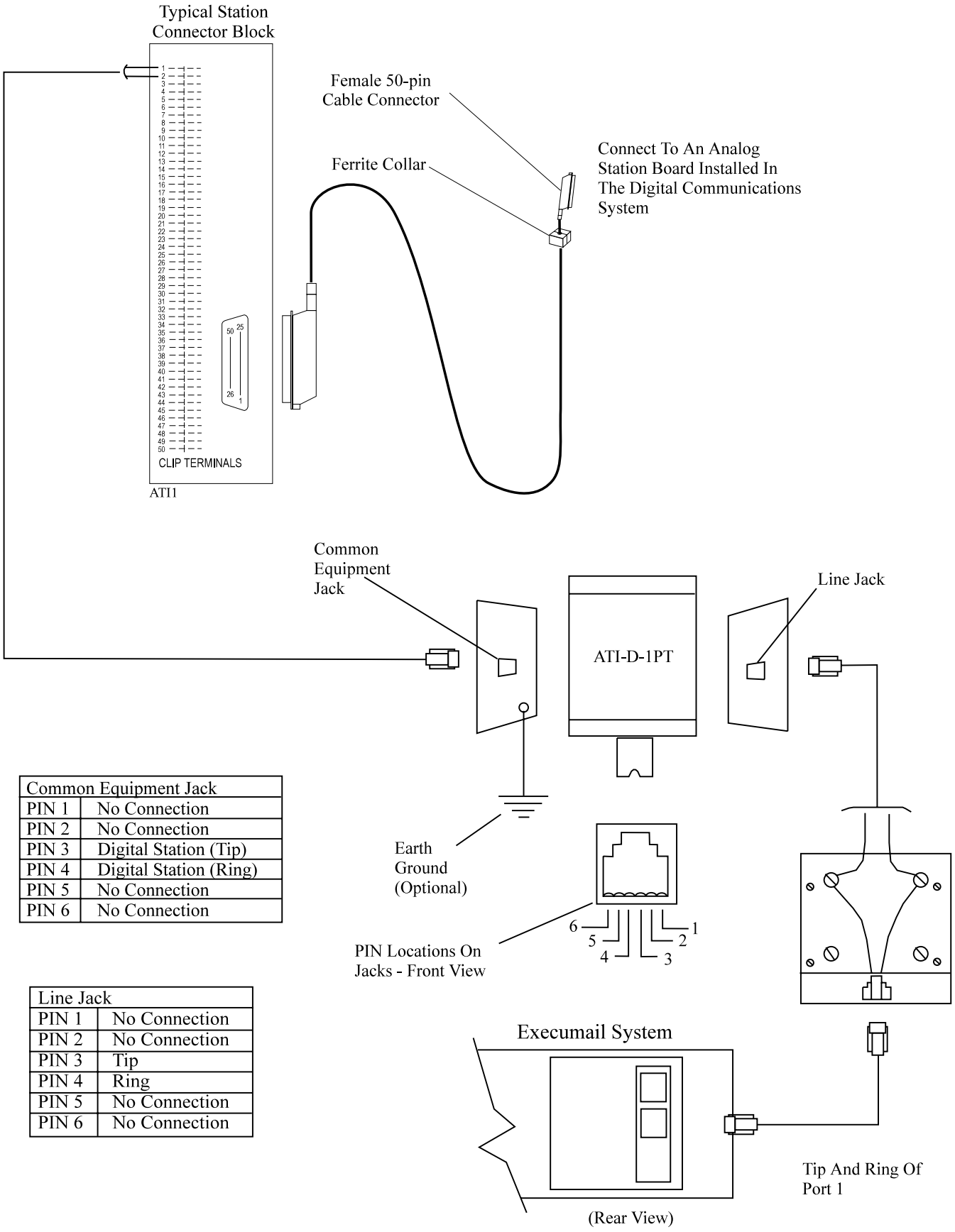
3.1.1 Verifying Proper ATI–D–1PT Connection

Use a voltmeter to check for the presence of voltage on the ATI–D–1PT IST jack.

1. Be sure wiring between ATI-D-1PT and common equipment station ports is installed.
2. Measure for DC voltage on IST jack:
   - Measure between TIP leads and grounding stud on digital communications system common equipment cabinet.
   - Measure between RING leads and grounding stud on the digital communications system common equipment cabinet.
   - Measure between TIP leads and RING leads.

   The measured voltages must be within the limits detailed on the following table.

Measurement	Voltage
Tip to Ground	– 1 to + 1 VDC
Ring to Ground	– 27 to – 38 VDC
Tip to Ring	+ 28 to + 37 VDC
The TIP lead is positive with respect to the RING lead.	



Common Equipment Jack	
PIN 1	No Connection
PIN 2	No Connection
PIN 3	Digital Station (Tip)
PIN 4	Digital Station (Ring)
PIN 5	No Connection
PIN 6	No Connection

Line Jack	
PIN 1	No Connection
PIN 2	No Connection
PIN 3	Tip
PIN 4	Ring
PIN 5	No Connection
PIN 6	No Connection

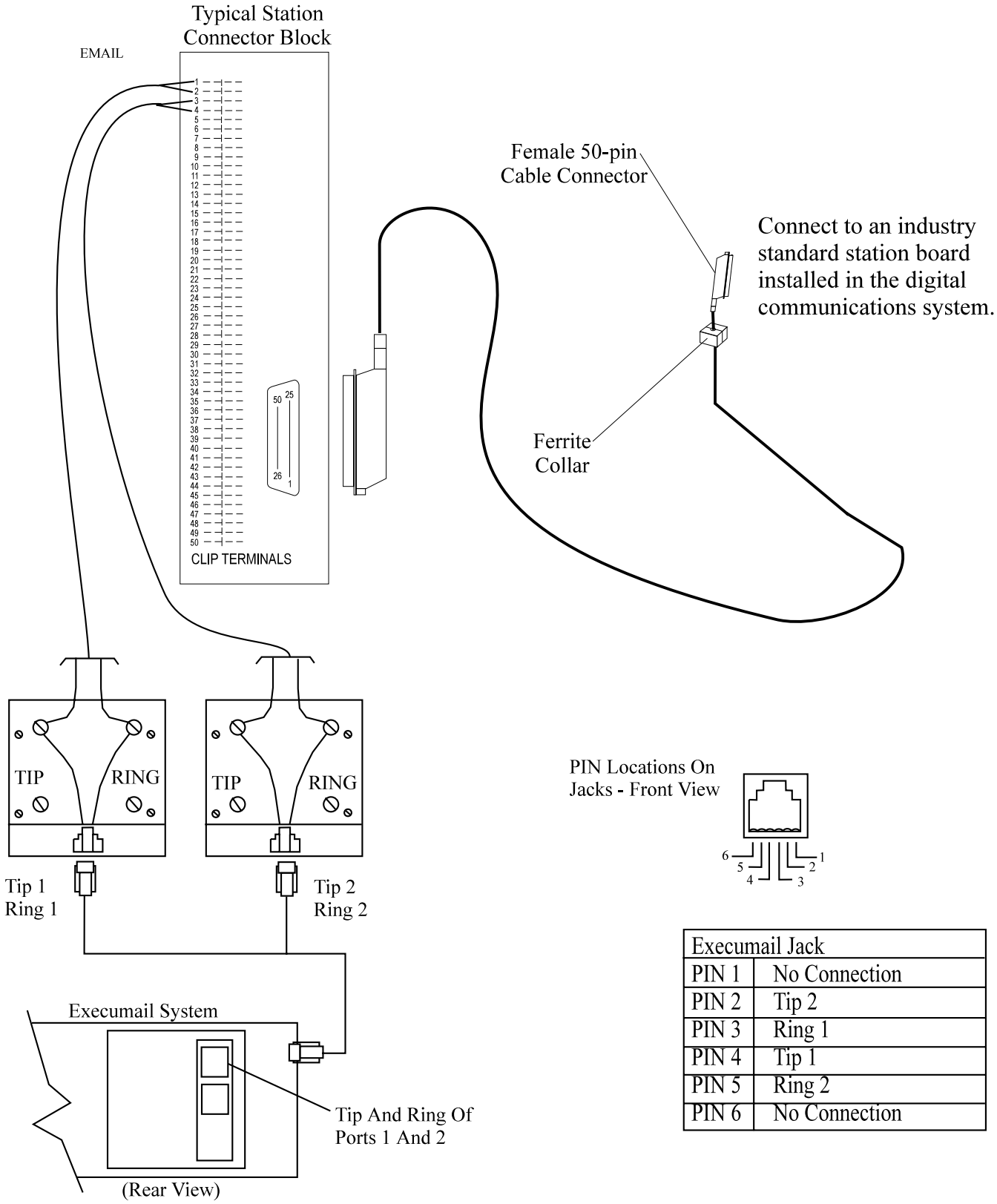
Interconnecting The ATI–D–1PT

4.0 Installing The ExecuMail System At Industry-Standard Telephone Station Ports

When you interface the ExecuMail system to the DXP system through the industry-standard telephone station ports on its industry-standard station board, you do not need an interface device; however, **you will need a station port for every ExecuMail port that you plan to connect. This means that for a four-port ExecuMail system, you will need four IST station ports.**

4.1 Connecting the ExecuMail System

- Route the necessary cabling, and connect the ExecuMail ports to the IST station ports per the connections detailed in the diagram shown on the next page.
  - Use one-pair (two-wire) cable for all connections.
- Inspect the wiring to verify that you have connected it properly.



Execumail Jack	
PIN 1	No Connection
PIN 2	Tip 2
PIN 3	Ring 1
PIN 4	Tip 1
PIN 5	Ring 2
PIN 6	No Connection

Interconnecting ExecuMail Directly To System

5.0 Programming For Voice Mail Operation

After connecting an voice mail system to the digital communications system, program the system to operate properly with ExecuMail by using the procedures detailed below. They are presented here in a typical order of progression but you can perform them in any order that is convenient.

5.1 Arranging Station Ports For Voice Mail Use

Description: After you or your installer has connected voice mail ports to the system station ports through the appropriate interface devices (for example, the VMI-X interface device used with analog station ports, the ATI-D-1PT interface device used with the digital station ports, or the industry standard telephone station board used with industry-standard telephone ports), you must identify the station ports where these devices are connected.

Programming:
1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From station menu, select phone types and press ENTER.
4. Type row number for station port type
   (ExecuTech = analog, DigiTech = digital, IST = industry standard)
   and press ENTER.
5. Type row number for device connected to station port (VMI-X or ATI-D-1PT)
   and press ENTER. (This step not required for IST.)
6. Type station port number and press ENTER.
7. Repeat steps 1–6 for each station port used to interface with the voice mail system.

5.2 Assigning Intercom Numbers To Voice Mail Connections

Description: You must identify the station intercom number of each voice mail connection and link these numbers together to form a circular hunt group for call handling purposes. For example, assign intercom numbers 121, 122, 123, and 124 to voice mail ports 1, 2, 3, and 4 then link 121 to 122, 122 to 123, 123 to 124, and 124 to 121.

Programming Hint: To make the LCD readouts at the system telephones more descriptive during call transfers, assign a descriptive name to the personal intercom numbers. If you do this, be sure to name each voice mail port differently. For instance, you can name them VM1, VM2, VM3, and VM4; however, do not name each port VM without personalizing it further with a unique suffix (such as 1, 2, 3, 4 or A, B, C, D for example).

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select voice mail and press ENTER.
4. From voice mail menu, type the row number for the voice mail port (1–32)
   and press ENTER.
5. Type the personal intercom number for the station port that this voice mail port is connected to.
6. Press TAB for linked station column and type personal intercom number for station port to be linked to the station port named in step 5.
7. Press ESCAPE and repeat steps 4–6 for next row number.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER to end.

5.3 Arranging Voice Mail Call Transfer Parameters

5.3.1 Automatic Attendant Transfer On Busy

Description: You can enable automatic attendant transfer on busy for individual station ports if you wish. With this feature enabled, the system will ring a busy telephone when the voice mail system is attempting to transfer a call to it thus giving the user the option of leaving his or her present call and taking the new one. With the feature disabled, the busy telephone is not signalled by the presence of a new call and voice mail will automatically route it to the busy telephone's voice mail box.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. When finished press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

5.3.2 Immediate Transfer

Description: You should choose the automatic attendant immediate transfer mode for voice mail transfers. It allows the system to transfer a call as soon as it answers. However, if you turn on the voice mail screen and confirm options (see the voice mail programming manual for details), do not turn on the immediate transfer mode. Immediate transfer is a system-wide parameter and affects all telephones in the system.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From system parameters menu, type item number for feature and press ENTER.
5. Press SPACE bar for feature setting and press ENTER.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

5.4 Assigning Transfer-To-Voice Mail Button

Description: A system user can use a pre-programmed button to transfer an incoming call directly to a voice mail box so the caller can leave a message. You must use the button mapping programming procedure to assign this Transfer-To-Voice Mail button at a system telephone.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select button mapping and press ENTER.
4. Type prime intercom number or previously assigned name and press ENTER. The VDT presents a button map with current button functions for requested station shown for review.
5. Type code (L1–L25) for button that you wish to program and press ENTER.
6. Type mnemonic for transfer-to-voice mail button and press ENTER.

*NOTE: Type **XVM** and a two-digit code (0–32) that equals one of the voice mail ports. Usually, you will enter the code for the first voice mail port and let the extension number linking (that you have previously arranged) decide which voice mail port actually handles the call. However if you have arranged voice mail ports into groups for department answering, enter the voice mail port code for the group that also includes the telephone that you are button mapping.*

7. When finished, press ESCAPE twice.

5.5 Arranging Voice Mail Ringing Options

Description: The digital communications system automatically enables ringing line preference at the voice mail station ports. With this feature enabled, the voice mail system's automatic attendant will answer calls. You can use direct, delayed, or night ringing features to determine how quickly or when it does this. With direct ringing, calls ring at the voice mail port immediately. With delayed ringing, the calls wait before ringing the voice mail port. This gives you the flexibility of having calls direct ring at a telephone where they can be answered by a human operator before they delay ring and the automated attendant answers them.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number of voice mail station port and press ENTER.
5. From station programming menu, type item number for desired ringing and press ENTER.
6. Press CONTROL E.
7. Type a for add or type r for remove and press ENTER.
8. Type line port number for lines assigned to voice mail port (type as n,nn,nnn, or n–nnn) and press ENTER.
9. When finished press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each voice mail port or press ESCAPE to end.

5.6 Assigning Voice Mail Identification (ID) Number

Description: As an option, you can assign an identification number to each line so that the voice mail system can provide customized call handling on a per line basis. Use voice mail system programming to match this ID number to a particular personal directory or transaction box within the voice mail system. When the digital communications system routes a call that is ringing at a particular line to the voice mail system to be answered, it routes it with the ID number. The voice mail system then sends the call to the box that corresponds to the line's ID number. You can use voice mail system programming to construct customized answering prompts for the individual boxes. This allows the IDed lines to be answered in a customized manner by the voice mail system's automatic attendant.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select line and press ENTER.
3. Type port number of line to be programmed and press ENTER.
4. From the line menu, select item number for feature and press ENTER.
5. Type the identification (ID) number and press ENTER.
6. Press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
8. Repeat steps 3–7 for each line or press ESCAPE to end.

5.7 Enabling Extended DTMF Tones For Voice Mail Use

Description: The system provides a means by which you can set the length of the DTMF tones that it generates when a user dials a number from his or her telephone. Since the voice mail system may require a different DTMF tone length than that which you have provided for the telephones, the system provides a means for you to set a separate DTMF tone length for voice mail station ports. It defaults the length to 80 msec, but you can program other lengths as needed.

Programming:
1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER.
4. From system timing menu, type item number for feature and press ENTER.
5. Press SPACE bar for time and press ENTER to accept setting.
6. When finished, press ESCAPE twice.
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

5.8 Setting The Voice Mail Integration Digits

Description: You can choose the DTMF digits that the digital communications system sends to a voice mail system. A voice mail system uses these DTMF digits to determine system and station status so that it can properly process a call. You must be versed in your voice mail's requirements before you can assign DTMF integration digits. The system defaults the voice mail parameters to match the Comdial voice mail system. Certain applications in countries with dialing plans different than the United States may require different integration digits. The default digits are shown in the following list and discussed below:

Follow Extension ID = 2	Intercom/Answer Confirmation = 1
Busy = 2	Do Not Disturb = 3
Incoming Intercom Answer = 9	Disconnect = A

Follow Extension ID – When the voice mail system receives a forwarded call from a ring no-answer (RNA) or busy station, the DXP sends to the voice mail system the extension number of the forwarded call followed by this DTMF digit (n). The DXP sends this digit within 500 ms of the time the voice mail system answers the call. For example, if extension 101 is forwarded to voice mail and voice mail answers a forward RNA or busy forwarded call, the DXP sends 101n to the voice mail system within 500 ms of the answer time.

Intercom/Answer Confirmation – The DXP sends this DTMF digit to the voice mail system to confirm that an intercom path (without dial tone) is available for the voice mail system's call transfer or dialing use. The DXP sends this digit within 500 ms of the time it detects the voice mail system's off-hook or hookflash condition. The DXP also immediately sends this digit to the voice mail system when a station answers a voice mail transferred call. This action can alert the voice mail system to disconnect and leave the parties connected.

Busy – If the voice mail system transfers a call to a station that is busy on a call, the DXP sends this DTMF digit to the voice system. When the voice mail system receives this digit, it can abandon the transfer, reconnect to the call, and offer the caller whatever options the the voice mail system has available in its programming. If the DXP auto attendant transfer on busy feature is active, the DXP will not send the DTMF digit to the voice mail system thus allowing the system to transfer a second call to the station.

DND – If the voice mail system transfers a call to a station that is in the do not disturb (DND) mode, the DXP sends this DTMF digit to the voice system. Receiving this digit allows the voice mail system to distinguish between a busy and a DND condition and offer the caller the appropriate choices.

Incoming Intercom Answer – The DXP sends this DTMF digit to the voice mail system when a station user makes an intercom call to the voice mail system. This action allows the voice mail system to distinguish between internal and external calls and offer the caller appropriate prompts and dialing options.

Disconnect – When an outside line or intercom party hangs up, the DXP sends this DTMF digit to the voice mail system to command an immediate disconnect. For outside calls, the central office (CO) must provide disconnect supervision to the DXP and you must program the DXP line for abandon hold release and disconnect supervision. At default, the DXP sends the DTMF tone for the A character as the disconnect digit. Since a caller cannot dial an A from a telephone, this feature eliminates callers from causing an accidental disconnect by dialing this digit on their telephone's dial pad.

5.8.1 Programming The Voice Mail Integration Digits

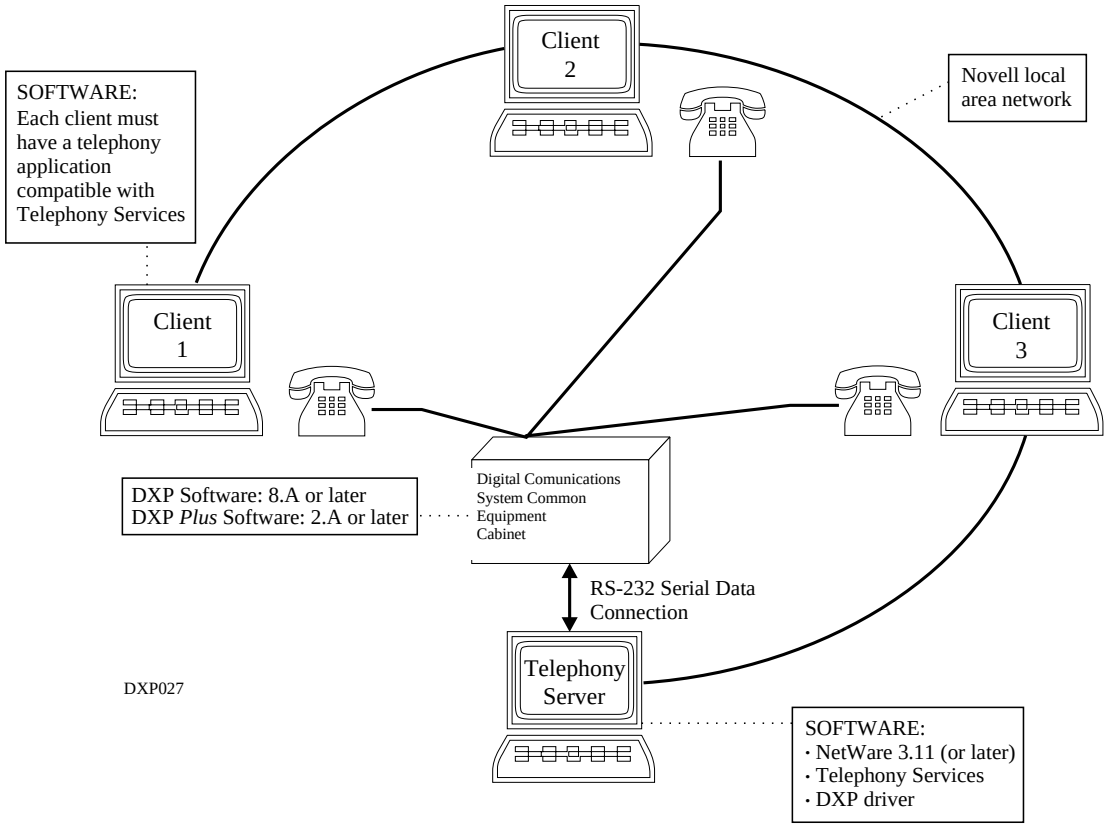
Programming:
1. Press CONTROL T for main menu.
2. From main menu, select peripherals and press ENTER.
3. From peripherals menu, select voice mail and press ENTER.
4. From the voice mail menu select integration digits and press ENTER.
5. From the integration digits menu, type row number for item and press ENTER.
6. Type entry and press ENTER.
7. Repeat step 6 until finished.
8. When finished, press ESCAPE twice.
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
10. Press ESCAPE twice to return to main menu.

Installing And Using The Comdial Enterprise Interface For Telephony Services

1.0 Introducing This Option

This option is a driver for the DXP and DXP *Plus* digital communications systems. When installed on a Novell* local area network (LAN) telephony server, the driver software integrates the digital communications system with the computer network. The other software required for the system to operate is Novell NetWare* and Novell Telephony Services* installed on the server. Also, one of the commercially-available telephony applications must be installed on each client. A client is an individual personal computer (PC) connected to the network.

This option makes many of the digital communications system features available to telephony application programs running on client PCs. The illustration below shows a simple network configured for three clients using this technology usually referred to as Computer Telephone Integration (CTI).



Detailing A Simple Computer Telephone Integration System

*Novell, Novell NetWare, and Novell Telephony Services are trade names of Novell Inc., Orem, UT.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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1.1 Understanding The Option's Part Number

The two or three digit suffix of the part number equals the total number of simultaneous Telephony Services users. The table below lists the various kits that are available.

NOTE: The license size for the Comdial driver option should equal or exceed the current license size for Novell Telephony Services to assure that no users are denied access to the many features of Telephony Services. However, it is not required that the license sizes for Novell NetWare and Telephony Services be exactly the same. For example, Telephony Services may be installed using a Novell Runtime license (two user).

Kit Part Numbers

PART NUMBERS	*DESCRIPTION OF KIT*
Enterprise Telephony Services NLM for Digital Communications System	
ENTTS-COM005	Comdial Driver (NLM) - 5 user
ENTTS-COM010	Comdial Driver (NLM) -10 user
ENTTS-COM025	Comdial Driver (NLM) -25 user
ENTTS-COM050	Comdial Driver (NLM) -50 user
ENTTS-COM100	Comdial Driver (NLM) -100 user
ENTTS-COM250	Comdial Driver (NLM) -250 user
Enterprise and Novell Telephony Services NLM for Digital Communications System with Runtime License	
ENTTS-010-3X	Novell Telephony Services, 3X Runtime and the Comdial Driver - 10 user
ENTTS-025-3X	Novell Telephony Services, 3X Runtime and the Comdial Driver - 25 user
ENTTS-050-3X	Novell Telephony Services, 3X Runtime and the Comdial Driver - 50 user
ENTTS-100-3X	Novell Telephony Services, 3X Runtime and the Comdial Driver - 100 user
ENTTS-250-3X	Novell Telephony Services, 3X Runtime and the Comdial Driver - 250 user
ENTTS-010-4X	Novell Telephony Services, 4X Runtime and the Comdial Driver - 10 user
ENTTS-025-4X	Novell Telephony Services, 4X Runtime and the Comdial Driver - 25 user
ENTTS-050-4X	Novell Telephony Services, 4X Runtime and the Comdial Driver - 50 user
ENTTS-100-4X	Novell Telephony Services, 4X Runtime and the Comdial Driver - 100 user
ENTTS-250-4X	Novell Telephony Services, 4X Runtime and the Comdial Driver - 250 user
Enterprise and Novell Telephony Services NLM for DXP	
ENTTS-010	Novell Telephony Services and the Comdial Driver - 10 user
ENTTS-025	Novell Telephony Services and the Comdial Driver - 25 user
ENTTS-050	Novell Telephony Services and the Comdial Driver - 50 user
ENTTS-100	Novell Telephony Services and the Comdial Driver - 100 user
ENTTS-250	Novell Telephony Services and the Comdial Driver - 250 user

1.2 About The Server

The LAN telephony server is a DOS-based personal computer (PC) using Novell NetWare and Novell Telephony Services software. The installer connects the telephony server to the communications network and the DXP system making Telephony Services available to individual PCs (clients) on the network. We strongly recommend that you install a separate, dedicated server to run Telephony Services.

1.3 Configuring Client PCs

To use the many Telephony Services features, you must configure each client PC on the network with one of the available telephony application programs compatible with Novell Telephony Services.

The Telephony Services application software package includes instructions for configuring client PCs.

1.4 Accessing System Features From Clients

When installed on your client PC, the telephony application gives you access to many powerful telephony features. Applications currently fall into these categories:

- call center applications such as using screen pop-ups to integrate caller ID with database records,
- message management that gives you access to voice-mail/fax/E-Mail through a single application, and
- PC control of desktop telephone features

1.5 Doing Telephony Services Administration Functions

From the server, you can do the following Telephony Services administrative functions:

- identify the software versions used by the digital communications system and Telephony Services,
- open a new server to system link,
- close an established server to system link,
- obtain link statistics such as busy hour, busy minute, or packets received,
- display active sessions,
- display monitored devices,
- change serial port configuration.

1.6 Introducing This Document

This document is for installers and administrators of Novell Telephony Services. Covered topics include installation, operation, and trouble shooting of the system driver for use in Novell Telephony Services environments.

For specific information concerning by the DXP and DXP Plus digital communications systems, refer to the appropriate system reference manuals.

1.6.1 Understanding Some Terms Used In This Document

Some terms used in this document that may be unfamiliar to you are defined below.

application - a software program containing a set of programming instructions. When installed on a personal computer, the application allows the PC to perform a particular task that *applies* to a specific activity such as word processing, desktop publishing, or telephony control.

Board - this term, as used in this document, refers to a logical, serial COM Board number. Both logical Board 0 and logical Board 1 may be on the same physical COM board.

caller ID - the name or telephone number, identified by the receiver, of the person originating a call.

CPU - Central Processing Unit. The main processing component of a personal computer.

DOS - Disk Operating System. The most popular version is MS-DOS[1] from Microsoft Corporation, Bellevue, WA. MS-DOS is the operating system used on IBM[2]-type PCs.

driver - software, that when loaded on a PC, provides instructions to the PC for controlling other devices connected to the PC.

E-Mail - Electronic Mail. Correspondence originated on a PC and transferred over a computer network.

fax - an abbreviation for facsimile. Facsimile is the name of equipment used for transmitting pictures and/or text over a switched telephone system to be printed out at a distant location.

filter - an operating parameter that can be set to limit the transfer of packets or portions of packets over a LAN.

LAN - Local Area Network. This refers to short-distance computer networks usually located within a building or a cluster of buildings close together. The LAN is used for tying several or many personal computers together for the purpose of communicating to one-another and for sharing resources such as printers and modems.

pop-up - refers to a window appearing on a computer screen containing a menu of user options.

[1] *MS-DOS is a registered trademark of Microsoft Corporation.*

[2] *IBM is a registered trademark of International Business Machines Corporation.*

NCF - Novell Control File. This is a small batch file on the DXP driver diskette that loads selected parameters whenever you load the DXP driver on the network server.

NetWare - Novell's tradename for their operating system used for controlling networks.

Novell - the name of the company that develops and produces a popular line of software for use on computer networks.NLM - NetWare Loadable Module. This applies to a Novell NetWare-compatible software module that runs under NetWare when installed on a network server running NetWare. The DXP NLM software is included on the DXP driver diskette in this option kit. When installed on the network server, the DXP NLM controls the flow of information between the DXP system and the network.

packet - a block of digital data including control data for identifying origin, destination, and amount of data included in the packet.

Port - as sometimes used in this document, this term refers to an addressable location on a logical COM Board (example, Port:0 Board:1).

RAM - Random Access Memory. The personal computer's main memory. RAM can be overwritten and is volatile (data is lost on loss of power without battery backup).

RS-232 Serial Port - an electrical connector on a computer or other communications equipment where binary data in serial form passes into or out of the device according to the Recommended Standard 232-C.

session - an active communications connection, measured from beginning to end, between computers or applications on a LAN.

software key - an electronic device connected to the server's active RS-232 port that activates the Telephony Service's software and prevents unauthorized duplication of the software product.

system - DXP or DXP *Plus* digital communications systems.

telephony server - the controlling PC on a local area network providing integrated computer and telephone services to individual PC users on the network.

Telephony Services - Novell's tradename for their network software used for providing telephony features to clients on the network.

2.0 Installing The Interface Option

This section describes the process for installing the interface option.

Make sure you have the following items before starting installation of this option.

- LAN server. This must be a DOS-based personal computer (PC) with the following:
  —386 or 486 CPU (486 CPU required for Novell NetWare 4X)
  —8 megabytes of available RAM (16 megabytes of RAM required for Novell NetWare 4X)
  —5 megabytes of free disk space on the *sys* volume
  —1 RS-232 port available
  —Novell NetWare software version 3.11 or higher (supplied in some kits)
- DXP digital communications system containing software version 8.A or higher or DXP *Plus* system containing software revision 2.A or higher
- Novell Telephony Services software (supplied in some kits)
- System driver (supplied in kit)
- Standard 6-conductor line cord (supplied in kit)
- Software key (supplied in kit)

Modular to 25-pin adapter (supplied in kit)

Even though the server may be located at some distance from the system, installation specialists recommend that you first connect it directly to the system. This is so you can do a system check to verify correct operation. Test the system with hand-shaking off and then on (preferred).

Once you have checked out the system, you can connect the server to the system through house wiring using modular jacks.

If a connection problem occurs with either type of installation, refer to section 2.4, *Checking The Signal Paths*, for a signal interconnect diagram. Using this diagram and an ohmmeter, to trace through all of the circuit paths between the server and system.

NOTE: *The standard 6-conductor line cord, as supplied in the this kit,"rolls-over" the signals. That is, the signal on pin 6 on one end of the line cord appears on pin 1 on the opposite end, and so forth..*

2.1 Connecting The Server Directly To The DXP System

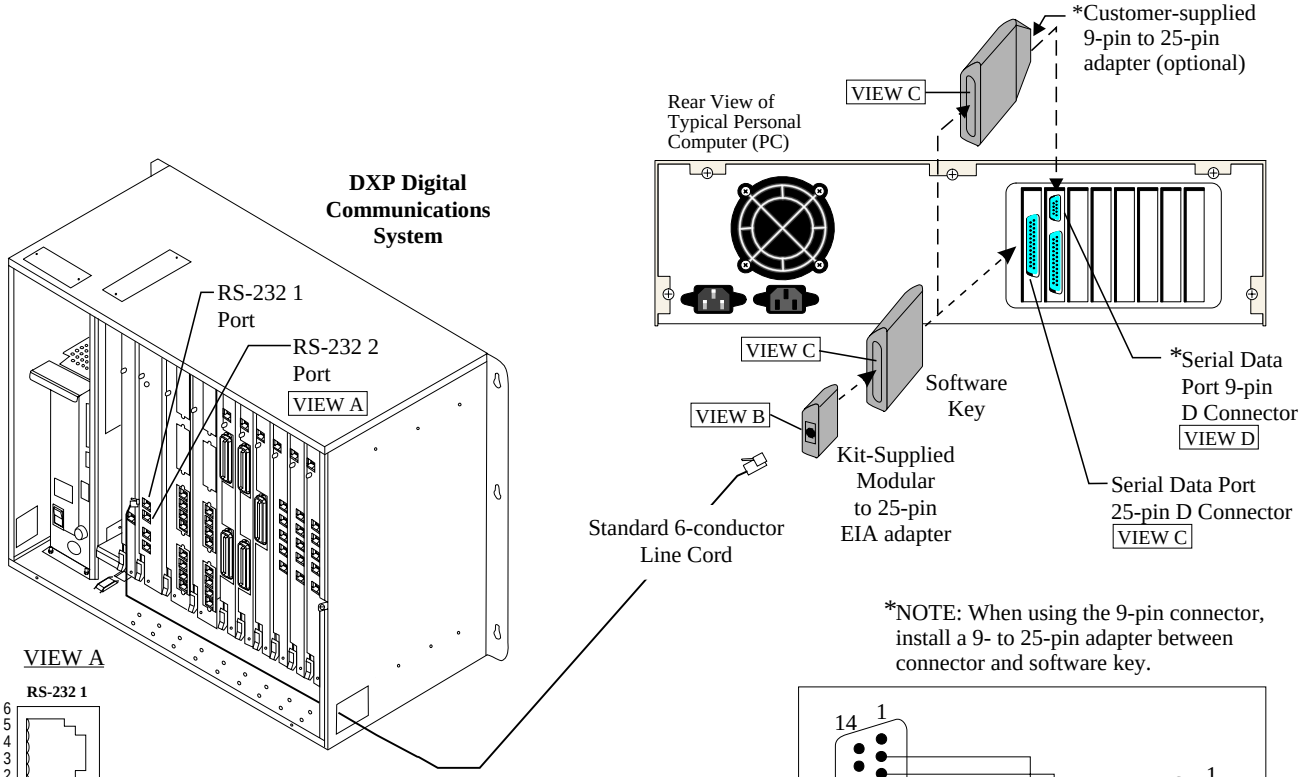
Install the following kit-supplied items: software key, modular to 25-pin EIA adapter, and 6-conductor line cord for connecting the server's RS-232 port to the system's serial data port.

1. Install the software key supplied in the kit on the 25-pin serial port on the rear of the server. If you are using the 9-pin serial port, you must first install a 9-to 25-pin adapter (see the following note).

NOTE: *When using the 9-pin serial port, locate a 9-to 25-pin adapter. These are available at most computer stores. Make sure pins 4 and 6 on the DB-9 end of the adapter are connected to pins 20 and 6 respectively on the DB-25 end. See Figure 2 for a connection diagram.*

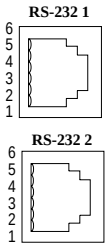
2. Plug the modular to 25-pin adapter supplied in the kit onto the connector on the software key.
3. Plug one end of the kit-supplied line cord into the modular connector on the adapter you installed in step 2. Plug the other end of the line cord into one of the serial ports labeled *RS-232 1* or *RS-232 2* on the front edge of the DXCPU board in the DXP common equipment cabinet.

NOTE*: Even though the DXAUX board in some DXP systems may contain additional RS-232 ports, use one of the two RS-232 serial ports on the DXCPU board for optimal performance of this option.*

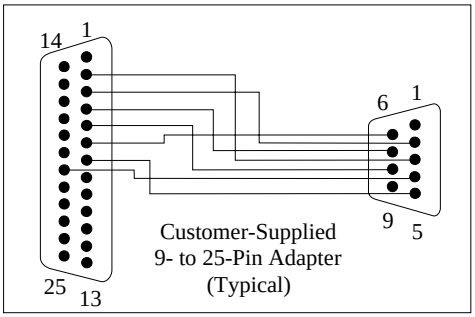


*NOTE: When using the 9-pin connector, install a 9- to 25-pin adapter between connector and software key.

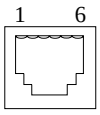
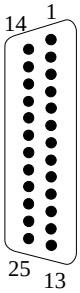
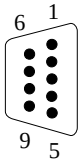
VIEW A

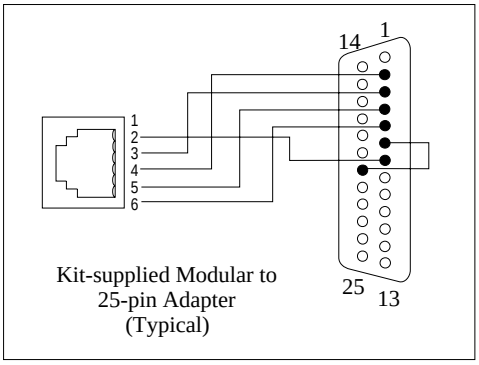


1 = RTS (Request To Send)
2 = CTS (Clear To Send)
3 = RD (Receive Data)
4 = TD (Transmit Data)
5 = GND (Ground)
6 = NC (No Connection)



RS-232 Ports (Server End)

VIEW B	VIEW C	VIEW D
 1 = NC 2 = GND 3 = RD 4 = TD 5 = RTS 6 = CTS	 1 = NC 2 = TD 3 = RD 4 = RTS 5 = CTS *6 = DSR 7 = GND *20 = DTR	 1 = NC 2 = RD 3 = TD 4 = DTR 5 = GND 6 = DSR 7 = RTS 8 = CTS 9 = NC



*DSR (Data Set Ready) and DTR (Data Terminal Ready) are connected kit-supplied inside modular to 25-pin adapter.

DXP021A

Connecting The Server Directly To The DXP System

2.2 Connecting The Server Directly To The DXP Plus System

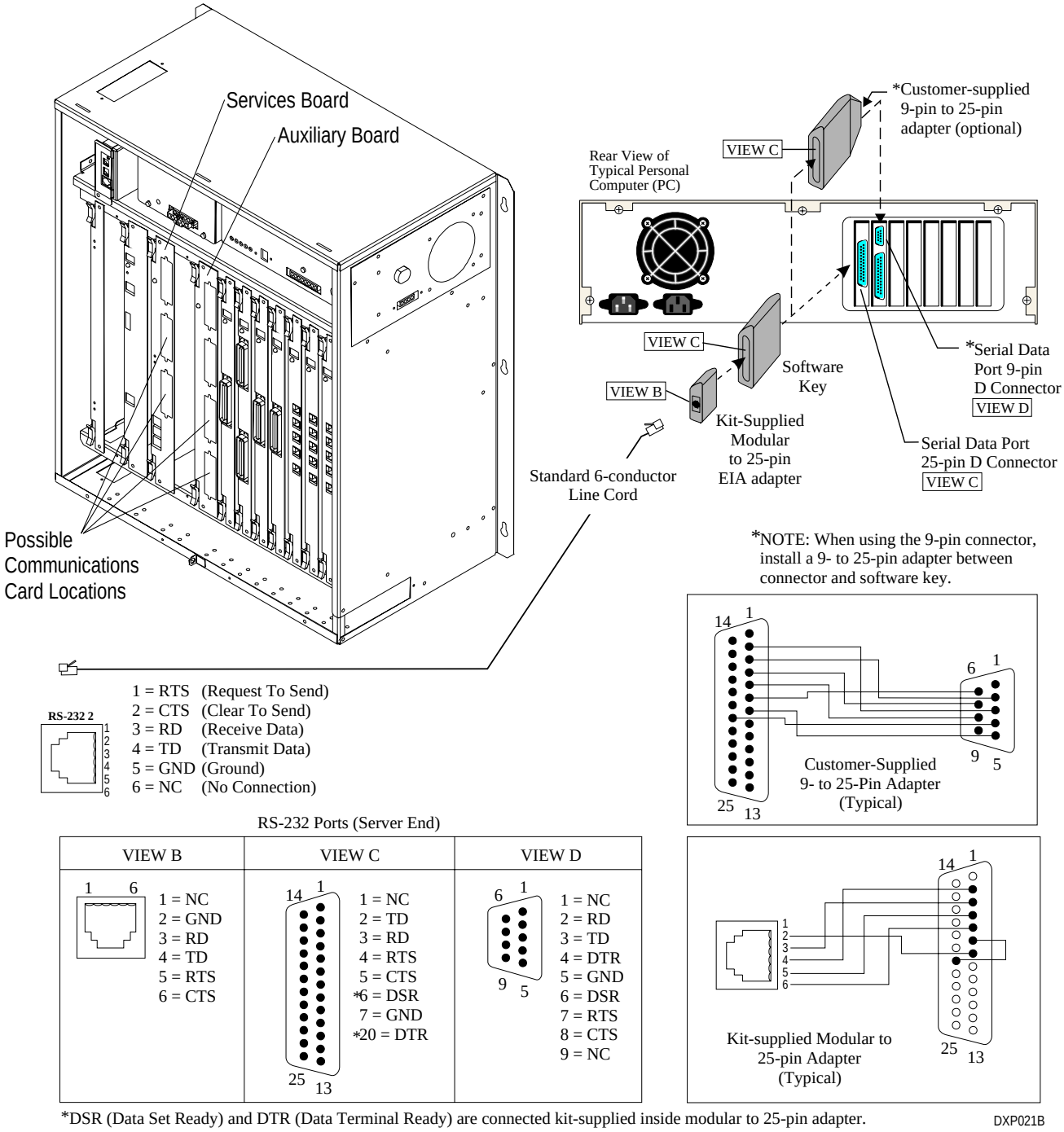
You must install a communications card in the DXP Plus to provide a serial port that you can use as the server interface. Since this is a detailed installation, it is important that you refer to IMI89–190, Installing The DXOPT–COM Communications Card In The DXP Plus Digital Communications System, for complete installation details. This communications card that supplies the serial data port may be located on the services board or the auxiliary board installed in the main DXP Plus equipment cabinet or the card may be located on the interface board in either the upper or lower expansion cabinets. Regardless of the location, the connector pin-out is the same and the data baud rate is 9600 baud.

Once you have provided a serial data port for the server to use, install the following kit-supplied items: software key, modular to 25-pin EIA adapter, and 6-conductor line cord for connecting the server's RS-232 port to the DXP Plus system.

1. Install the software key supplied in the kit on the 25-pin serial port on the rear of the server. If you are using the 9-pin serial port, you must first install a 9-to 25-pin adapter (see the following note).

NOTE: When using the 9-pin serial port, locate a 9-to 25-pin adapter. These are available at most computer stores. Make sure pins 4 and 6 on the DB-9 end of the adapter are connected to pins 20 and 6 respectively on the DB-25 end.

2. Plug the modular to 25-pin adapter supplied in the kit onto the connector on the software key.
3. Plug one end of the kit-supplied line cord into the modular connector on the adapter you installed in step 2. Plug the other end of the line cord into the DXP Plus' serial port that you made available with the communications card.



Connecting The Server Directly To The DXP Plus System

2.3 Connecting The Server Through House Wiring

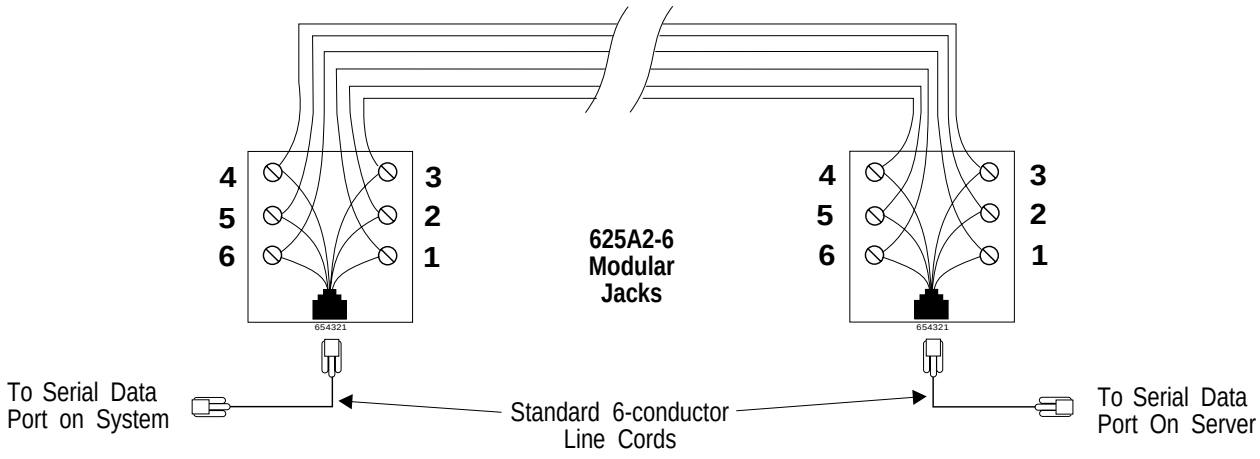
Before using house wiring to connect the server to the system, make a direct connection and test the equipment for proper operation without the added complications sometimes caused by house wiring.

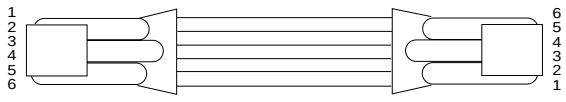
The recommended maximum hard-wired distance for server to system interconnection using 24-gauge wire is 500 feet for a 9600-baud transmission rate.

1. Install a customer-supplied 9-pin to 25-pin adapter (if applicable), the kit-supplied software key, and the kit-supplied 25-pin to modular adapter on the rear of the server as described in sections 2.1 and 2.2.
2. Plug one end of the kit-supplied line cord into the modular connector on the 25-pin to modular adapter you installed in step 1. Plug the other end of the line cord into the modular jack on the server-end of the house wiring.
3. Using a customer-supplied, standard 6-conductor line cord, plug one end of the line cord into the jack on the system-end of the house wiring. Plug the other end of the line cord into the appropriate system serial data port
4. If a connection problem occurs, refer to section 2.4 for a signal interconnect diagram. Using this diagram and an ohmmeter, you can trace through all of the circuit paths between the server and system to verify that you made the correct connections**.**

CAUTION

A standard 6-conductor line cord introduces a signal roll-over from one end to the other. You must maintain this signal roll-over when you install the house wiring. The illustration below shows this roll-over in place in the wiring from one modular jack to the other. The additional roll-overs introduced by the connecting line cords negate one another and are not a factor for consideration.





Standard
6-Conductor Line Cord

DXP029

Connecting The Server Through House Wiring

2.4 Checking Signal Paths

To verify correct signal paths between the server and the system, use the following illustration to locate the signal paths and check them using an ohmmeter.

Be sure that the RD, TD, RTS, and CTS signals from the server connect to the appropriate signals at the system serial data port as detailed in this table.

Server Signal Connections		System Signal Connections	
9-Pin Serial Connector	25-Pin Serial Connector	Modular Serial Data Connector	
RDPin 2	RD Pin 3	TD	Pin 4
TDPin 3	TD Pin 2	RD	Pin 3
RTSPin 7	RTS Pin 4	CTS	Pin 2
CTSPin 8	CTS Pin 5	RTS	Pin 1

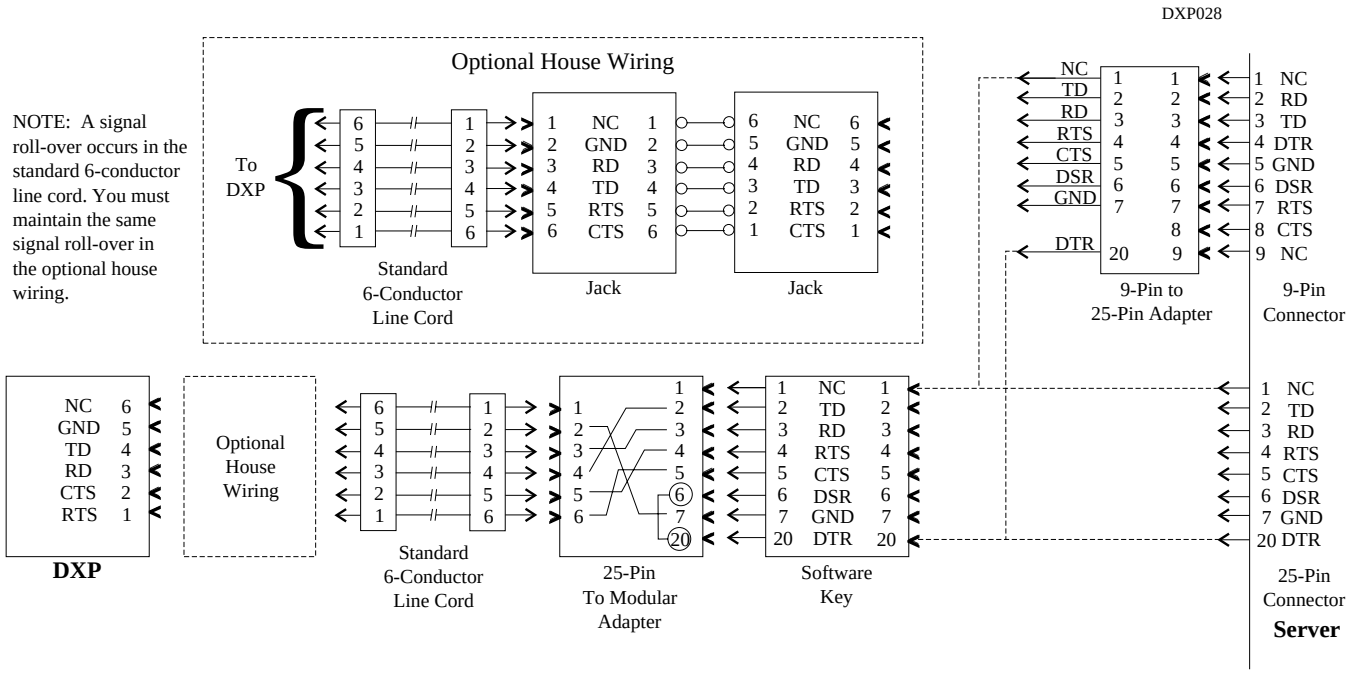

DXP028
Optional House Wiring
NOTE: A signal roll-over occurs in the standard 6-conductor line cord. You must maintain the same signal roll-over in the optional house wiring.
To DXP
Standard 6-Conductor Line Cord
Jack
Jack
NC TD RD RTS CTS DSR GND DTR
9-Pin to 25-Pin Adapter
9-Pin Connector
1 NC 2 RD 3 TD 4 DTR 5 GND 6 DSR 7 RTS 8 CTS 9 NC
NC GND TD RD CTS RTS
DXP
Optional House Wiring
Standard 6-Conductor Line Cord
25-Pin To Modular Adapter
Software Key
1 NC 2 TD 3 RD 4 RTS 5 CTS 6 DSR 7 GND 20 DTR
25-Pin Connector
Server

Figure 4. Examining The Signal Interconnections

2.5 Programming The DXP and DXP Plus System

You can change the baud rates, data bits, stop bits, parity, and flow control for each serial data port in the system to match the data device that you connect there. Select a serial port and set the parameters shown in the following table.

Baud Out	***Baud In***	***Data Bits***	***Stop Bits***	Parity	***Flow Control***
9600	9600	8	1	NONE	RTS/CTS

Once you enter the DXP or DXP Plus programming mode, perform the following steps;

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select serial ports and press ENTER.
4. From serial ports menu, type item number for main port or for auxiliary port and press ENTER.
5. From serial port type menu, select the serial port number and press ENTER.
6. Press SPACE bar for feature setting
7. Press TAB for next parameter.
8. Repeat steps 6 and 7 for all parameters.
9. Press ENTER to accept settings.
10. When finished, press ESCAPE twice.
11. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

2.6 Installing The Software

This section covers installation of the software on the LAN server.

1. Verify that the server includes Novell NetWare version 3.11 or higher. If not, follow the installation instructions provided with your version of NetWare and install it at this time.
2. Install the Novell Telephony Services software on the server by following the instructions provided with that software package.
3. Insert the kit-supplied diskette containing the system driver labeled *Enterprise Telephony Services* in an available floppy disk drive on the server. At the server console prompt (SERVER_NAME:), type: *load install*. Select Product Options and press **Ins** to install a new product. Select the drive letter corresponding to the drive containing the system driver software (diskette) and press **Enter**.
4. Type *COMDIAL* at the server prompt and press **Enter** to load the system driver.

3.0 Administering The Data Link From Server To System

This section covers system administration issues, including the opening and closing of the Telephony Services data link, and using the system driver/interface.

3.1 Using Administration Options

From the DXP Administration portion of the main menu, the following options exist:

1. About...
2. Active Session Information
3. DXP Link Administration
4. Select Active Serial Port

3.1.1 Using The About... Menu To Access Software Version Information

Selecting the About... menu option provides current software version information for both Telephony Services and the DXP system.

NOTES: 1. A Telephony Services Link must be active for the DXP Firmware Version to be shown; otherwise, the version will be shown as UNKNOWN.

2. At least one active session must exist before the Telephony Services driver version can be shown; otherwise, the version will be shown as UNKNOWN.

3.1.2 Using The Active Session Information Menu

Selecting the Active Session Information menu option provides the following options:

1. Display Active Sessions
2. Display Monitored Calls
3. Display Monitored Devices

3.1.2.1 Displaying Active Sessions

Selecting the Display Active Sessions option shows a list of all active sessions for the active serial port. Sessions are displayed by Log-in Name and Telephony Services Session ID.

3.1.2.2 Displaying Monitored Calls

NOTE: the Display Monitored Calls option is not currently available.

3.1.2.3 Displaying Monitored Devices

Selecting the Display Monitored Devices option shows a list of all active device monitors for the active serial port. For each device monitor, the following is shown:

1. Device being monitored.
2. Log-in Name of the session monitoring the device.
3. Session ID of the session monitoring the device.
4. Application name associated with the session.
5. Monitor Cross Reference ID.
6. Filter value.

3.1.3 Using The Link Administration Menu Options

Selecting the Link Administration menu option provides additional options as follows:

1. Clear Port Statistics
2. Close DXP Link
3. Edit Port Configuration
4. Open DXP Link

The first line of the option screen shows the active serial port (example, “Board:0 Port:0").

3.1.3.1 Clearing Port Statistics

Selecting this option resets all of the monitored items on the “Link Statistics Screen” such as busy hour, busy minute, and packets received.

3.1.3.2 Closing A Link

Selecting the close link option terminates the Telephony Services link established for the active serial port. Any other active links are unaffected.

3.1.3.3 Editing Port Configuration

Selecting this option allows you to modify the following parameters:

- Baud Rate
- Link Name
- Hardware Handshaking
- Auto Link Initialization

Modify these parameters as follows:

1. Using the cursor keys, select the parameter you wish to modify.
2. Select a new value.
3. Press Esc to save your new values.

NOTE: The new values become effective the next time you load the DXP driver (see section 2.2, “Installing The Software”).

3.1.3.4 Opening A Link

Selecting the open link option establishes a link to the system using the active serial port. Any other active links to other systems are unaffected. If the server is unable to establish a link, the screen shows a Link Failed message. If this occurs, verify cable connections and try again. If you are still unable to establish a link, please refer to the “Trouble shooting” section in this document for other possible causes. See also section 3.2.

3.1.4 Selecting An Active Serial Port

Use this menu option to select an active serial port from the list of available ports. The system driver locates all available ports when it is loaded.

4.0 Trouble shooting The Interface Option

Problem	Possible Cause
Unable to load Comdial NLM	1. Telephony Service's software not installed correctly. 2. Telephony Service's network loadable module (NLM) not loaded. The COMDIAL.NCF file on the supplied diskette shows the loading order of all required NLM's
Cannot establish DXP link	1. Line cord between server and DXP not connected or loose connection in house wiring, if used. 2. Software key incorrect or not installed. 3. DB-9 to DB-25 adapter does not have pins 4 and 6 from the DB-9 side. These pins are needed for establishing communications (handshaking) between the server and the DXP system. 4. CTS/RTS flow control not selected on the DXP system port. 5. Line cord connected to the wrong port on the server. 6. Incorrect baud rate selected on the DXP system. 7. Incorrect active port selected in driver administration.
Access denied to Telephony Services installation. For example, Telephony Services installation and license is for 100 users while the software key is for a system driver compatible with a 50-user installation.	Software key not compatible with size of Telephony Services

COMDIAL®

Installing And Programming The Analog Terminal Interface On The Digital Communications System

1.0 Introducing The Analog Terminal Interface

This publication describes the features, applications, installation, and specifications of the Comdial Analog Telephone Interface (ATI-D-1PT). The ATI-D-1PT is a multipurpose, **on-premise** accessory for the digital communications system. It provides the following features:

- INDUSTRY-STANDARD TELEPHONE (IST) INTERFACE -This feature adapts most industry-standard telephone (IST) devices to the digital station board of the DXP system. The ATI-D-1PT will accept both tone (DTMF) and pulse (rotary) dialing from these devices.

CAUTION

The ATI-D-1PT by itself does not support any off-premise service. Never connect the ATI-D-1PT to a telephone company-supplied line unless an acceptable OPX long loop adapter is installed. Refer the installation section for adapter installation instructions.

The ATI-D-1PT is housed in a self-contained wall mountable metal enclosure. The ATI-D-1PT receives its power from the digital communications system through the station port connection. the ATI-D-1PT contains an internal ringing generator to generate a ringing signal for an IST and high quality, low-loss, balanced, telephone transmission circuitry that supports one IST input.

Connection between the ATI-D-1PT and a common equipment digital station port requires one single-pair cable (two-wire). Connection between the external analog IST equipment and the ATI-D-1PT requires Another single pair of wires. The ATI-D-1PT provides modular connectors to allow quick connections.

The ATI-D-1PT circuit will drive a load with a maximum ringer equivalence number (REN) of 2.0 thus allowing more than one IST connection at each interface input. Check the REN number of the connected IST equipment so as not to exceed the capacity of the ATI-D-1PT. Improper operation may result if the REN maximum of the ATI-D-1PT is exceeded.

The ATI-D-1PT supports a wide variety of IST equipment such as 500 and 2500-type telephones, cordless telephones, answering machines, FAX machines, and data modems.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

Printed in U.S.A.

IMI89–208.02
10/95

1.1 Detailing The Specifications

Electrical Specifications

Power requirements:	Supplied by the common equipment
Ringing voltage:	55 VAC Nominal @ 20 Hz (45 VAC minimum) Power rated to maximum REN = 2.0
Battery feed voltage:	24 VDC nominal
Loop current limits between ATI-D and IST interface:	20 ma min. at 620 ohms 70 ma max. at 0 ohms
DC loop limits from ATI-D to industry standard interface per port:	620 ohms maximum including interfaced telephony device (Approximately 4000 feet with #26 AWG twisted-pair cable and 300 ohm device load.) (Approximately 500 feet if two IST devices are connected in parallel on same tip and ring pair.)
Cable insulation resistance:	30,000 ohms minimum
Cable requirement ATI-D to common equipment:	2-pair twisted cable; 25 feet maximum length. (Both common equipment station ports must always be connected to the ATI-D for every installation.)
Cable terminations:	623-type, 4-conductor minijacks
Dialing:	Industry-standard DTMF or Dial pulse (rotary) with nominal make/break ratio of 40/60 @ 10 PPS

Environmental Specifications

Operating temperature:	32-122 F (0-50 C)
Humidity:	90 % relative, non-condensing

Mechanical Specifications

Height:	2.375 inches
Width:	8.062 inches
Length:	11.125 inches
Weight:	4 lbs. (plus 2 lbs. for packing material)

Industry/Regulatory Standards

FCC registered and listed for safety compliance as part of digital communications system

FCC certified, Part 15 (class A)

2.0 Installing The Analog Terminal Interface

2.1 Detailing The Mounting Considerations

1. The ATI-D-1PT can be attached to any sturdy, flat surface.

2. The distance between the ATI-D-1PT and the common equipment must be 25 feet or less.

3. The mounting location must be secure and dry and have adequate ventilation. The temperature range of the location must be within 32-122° F (0-50° C).

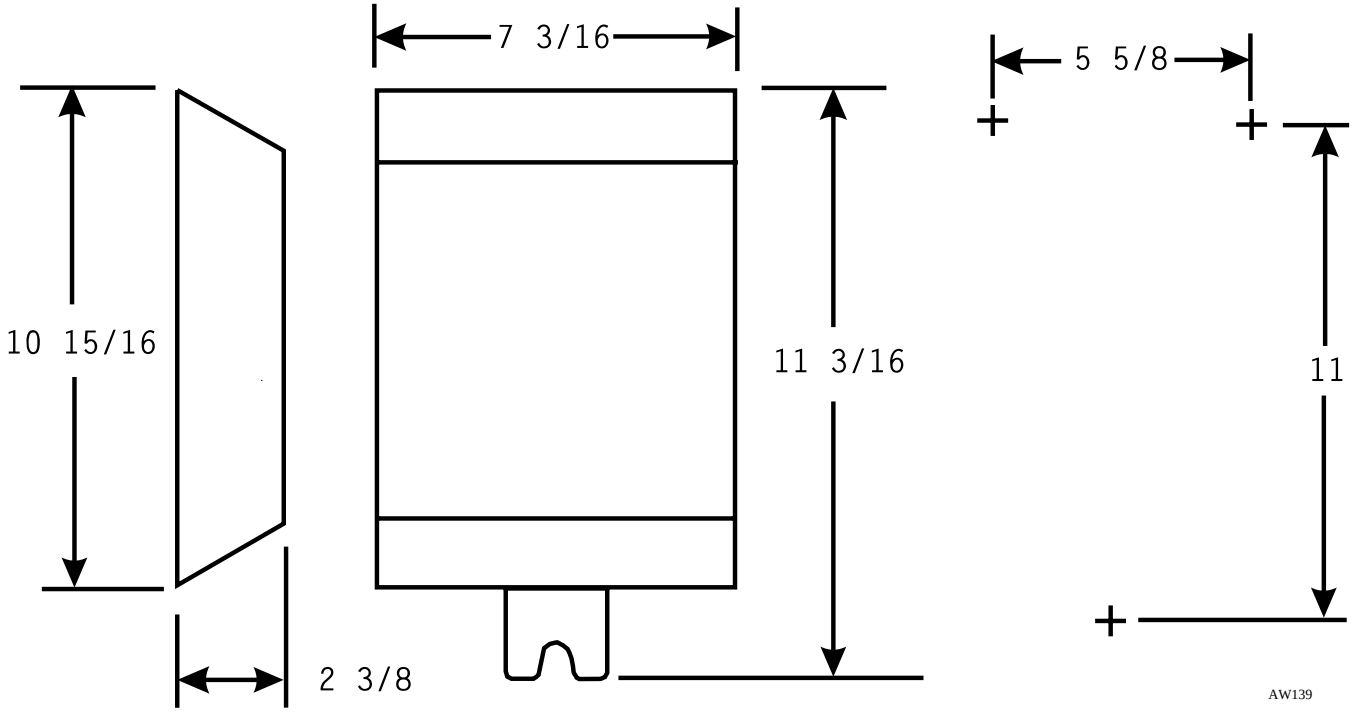
4. If the mounting surface is damp or if it is concrete or masonry material, a backboard must be attached to it before mounting the ATI-D. Suitable mounting backboards are available commercially or can be constructed out of 1/2-inch plywood cut to size.

5 Tools and hardware required for mounting the ATI-D include:

- Fasteners - wood screws (1/4 x 1-inch round head), toggle bolts, or wall anchors.
- Screwdriver - to match fasteners.
- Electric drill - if prepared holes are required.
- Connecting tool - for fastening wires to a type-66 connector block.
- Crimping tool - for 623-type modular plugs.

2.2 Mounting The Cabinet

1. Unpack and carefully inspect the ATI-D-1PT for shipping damage. Notify the shipper immediately of any damage found. Verify that the package contains all parts and accessories needed for proper installation and operation.
2. If a backboard is required at the mounting location, attach it securely to provide a stable mounting surface.
3. Use the base of the ATI-D-1PT as a template or measure for mounting hole locations per the dimension details shown in illustration.
4. **Drill holes of a proper size to accommodate the hardware being used into the mounting surface. If necessary, prepare these holes with inserts, anchors or other attachment devices as dictated by the type of mounting surface.**
5. **Insert the two top screws into the mounting surface and tighten them to within approximately 1/8-inch of the surface.**
6. **Hang the ATI-D-1PT on the top screws using the mounting holes located on the rear of the cabinet. Note that these holes are elongated with an enlargement at one end. This feature allows the cabinet to snap down on the screws to secure the mounting when the cabinet is hung on them.**
7. **Insert a third screw through the mounting tab located on the lower edge of the cabinet and into the mounting surface; tighten it into place.**



Outline Dimensions
(In Inches)

Spacing For
Mounting Hardware
(In Inches)

Detailing The ATI–D–1PT Dimensions

2.3 Connecting The Equipment

Connect the cabling to the ATI-D-1PT per the diagram shown on the next page

CAUTION

Be careful when connecting the wiring between the DXP Plus and the ATI-D-1PT. Be sure to connect the digital station port to the COMMON EQUIPMENT (KSU) jack on the ATI-D-1PT. Damage to the ATI-D-1PT could occur if this wiring is mistakenly connected to the IST jack.

- While a grounding wire is not required for operation, one is desirable for decreasing radio frequency interference and electrostatic discharge susceptibility. A ground stud is provided on the ATI-D-1PT housing for this purpose. Connect a #10 or #12, insulated, solid copper wire between this ground stud and a reliable earth ground.

2.4 Verifying Proper Installation

Use a voltmeter to check for the presence of voltage on the ATI-D-1PT IST jack.

1. Be sure the wiring between the ATI-D-1PT and the common equipment station ports is properly installed.
2. Measure for DC voltage on the IST jack:
   - Measure between TIP leads and common equipment grounding stud.
   - Measure between RING leads and common equipment grounding stud.
   - Measure between TIP leads and RING leads.

The measured voltage must be within following limits (with the IST device on-hook):

MEASUREMENT	VOLTAGE
Tip to Ground	-1 to +1 VDC
Ring to Ground	-27 to -38 VDC
Tip to Ring	+28 to +37 VDC (The TIP lead is positive with respect to the RING lead.)

2.5 Installing OPX Long Loop Adapter For Off-Premise Service

As stated previously, the ATI-D-1PT is an on-premise device. You must use an OPX long loop adapter if you wish to adapt the ATI-D-1PT to support an off-premise application.

An OPX long loop adapter connects to a single telephone line and can greatly extend the line's loop length (the Proctor Model 46222 adapter*, for example, can extend line length to 30,000 feet). In addition, such units can be used to interconnect key systems (to share central office lines and system features).

*Proctor & Associates Company, Redmond, WA.

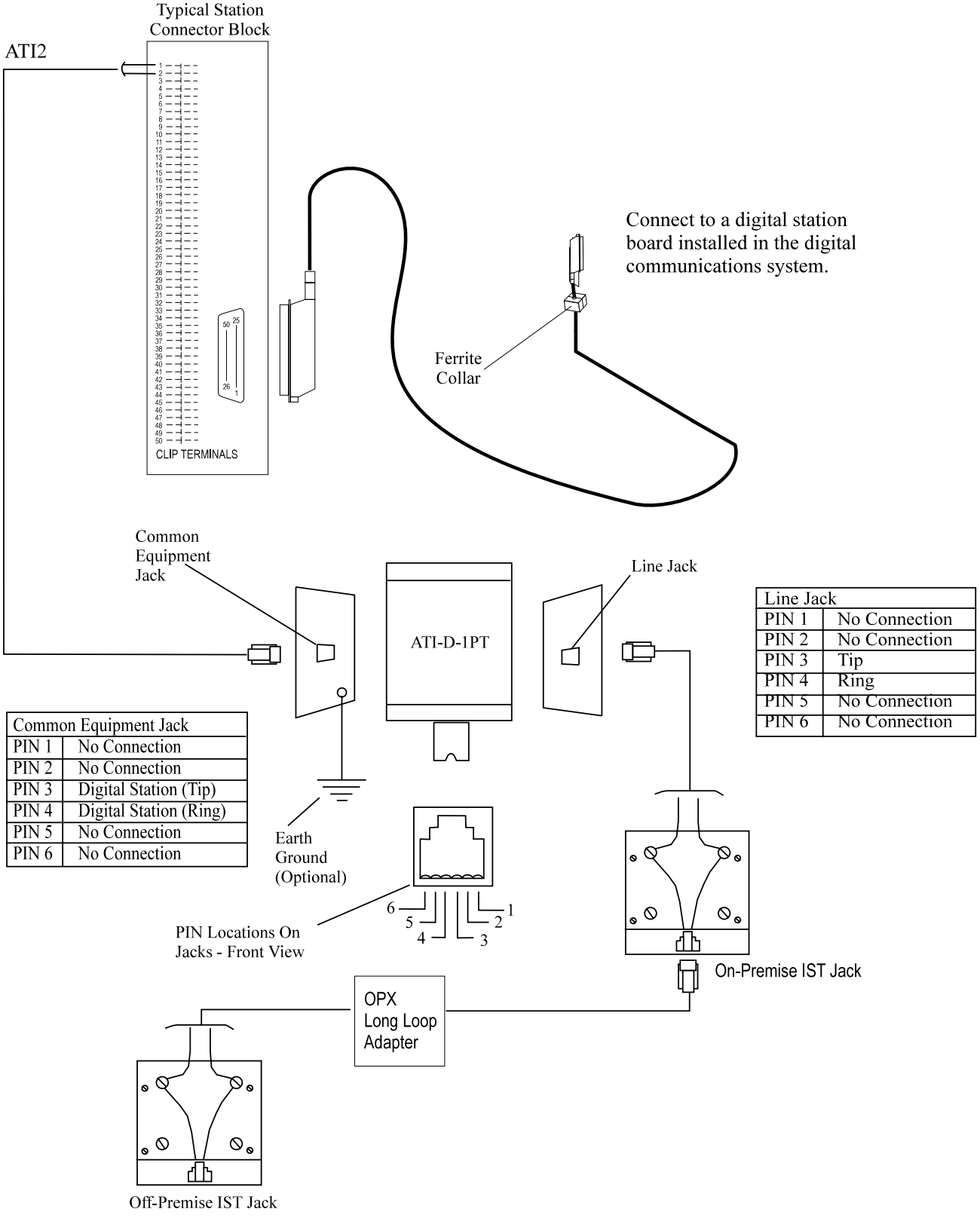
CAUTION

When you connect an adapter to an off-premise extension (OPX), you must insure that the telephone line routed to the OPX has primary protectors installed in series with the tip/ring pair to protect both the user and the equipment from transient voltage spikes that can travel through the cable. The telephone company offers basic protection against this condition, but it is usually designed to protect the central office circuits and you cannot rely upon it to protect common equipment. To help insure that external over-voltage surges do not damage the system, technical experts recommend that you install and properly ground gas discharge tubes or similar primary protection devices on the telephone line routed from the adapter to the off-premise extension.

To install the OPX long loop adapter:

- Follow manufacturer's instructions for unpacking, inspecting, mounting and wiring the adapter unit.
- Plug a modular cable into the system jack on the adapter and connect the opposite end of the cable to the IST jack on the ATI-D-1PT.

- Plug a modular cord into the telephone jack on the adapter and connect the opposite end of the cord to the OPX line.
- Plug the adapter power cord into a standard 117 VAC, 3-wire electrical outlet.



Common Equipment Jack	
PIN 1	No Connection
PIN 2	No Connection
PIN 3	Digital Station (Tip)
PIN 4	Digital Station (Ring)
PIN 5	No Connection
PIN 6	No Connection

Line Jack	
PIN 1	No Connection
PIN 2	No Connection
PIN 3	Tip
PIN 4	Ring
PIN 5	No Connection
PIN 6	No Connection

Interconnecting The ATI–D–1PT

3.0 Programming For Analog Terminal Interface Operation

The ATI-D-1PT provides the interfacing capability required to connect most industry standard telephone (IST) equipment to a digital station port of the digital communications system.

The IST provides basic intercom service coupled with the ability to access outside lines. You can program the station port (through which the IST is being interfaced via the ATI-D-1PT) for either prime intercom operation or prime line automatic and idle line preference operation. Default is for prime intercom. Under either operating condition, you can program the station port to receive outside line ringing and to match either the rotary or DTMF dialing employed by the IST.

3.1 Detailing The Prime Intercom Operating Condition

With key-system configured digital communications systems, a system multiline telephone user can extend line access for call origination to an IST station by employing the call transfer feature. To provide outside line ringing to a prime intercom IST, program the ATI-D-1PT station port to have the ringing line preference feature and then enable ringing for all lines that you want to ring at the IST.

With hybrid configured digital communications systems, you can make outside lines available to the IST for call origination by programming the IST for line group access. With line group access, the IST user can access an outside line by dialing the group access code over the intercom line. The digital communications system then selects one of the grouped lines for IST use.

3.2 Detailing The Prime Line Automatic Or Idle Line Preference Operating Condition

You can program an outside line as a prime line at the station port through which the IST is being interfaced, or you can program that station port for idle line preference and then assign several lines to the station port.

With either prime line automatic or idle line preference, the IST has outside line dial tone for call origination when its user lifts its handset. You can enable outside line ringing at the IST station port that you have programmed for either prime line automatic or idle line preference. Alternately, you can enable the ringing line preference feature for the IST station port.

The intercom line is still available to an IST even though you have provided outside line access. After going off-hook, the IST user obtains intercom dial tone by performing a hookflash (press and release the hookswitch) or by pressing the TAP button if one is available. Hookflash either drops the outside line (if the used dialed no digits after lifting the handset) or (if the user dialed some digits) places the line on hold and provides intercom dial tone.

3.3 Detailing The Distinctive Ringing Condition

Intercom calls that ring at equipment connected through an ATI-D-1PT have a different cadence than outside calls have. If desired, you can disable this distinctive ringing feature to make the intercom ring cadence the same as that for outside calls.

3.4 Detailing The Through Dialing Condition

You can program the station port through which the IST is being interfaced for through-dialing or you can disable the feature. The system automatically enables the feature when you connect an ATI-D-1PT to the station port. Through dialing enabled is necessary if the connected IST is a dual-tone multifrequency (DTMF) tone dial device that requires that its generated dialing tones pass through the ATI-D-1PT, the common equipment, and onto a tone dial compatible telephone line.

If the IST is a rotary telephone, you must disable the through dialing feature.

3.5 Programming Procedures

The ATI-D-1PT automatically identifies itself as an analog terminal interface for the digital station board as soon as you connect it to the digital communications system.

Prime Line Programming

Prime Line Type

When you enable this feature, the station automatically selects a line, line group, or intercom number for use when the station user takes the station off hook. Use the programming procedures shown below to select the line port, line group, or intercom number to serve as the prime station calling interface.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for desired value and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Prime Line

Use this procedure to choose the prime line.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or station name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. From prime line menu, type line port number and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Prime Intercom Number

Use this procedure to choose the prime intercom number.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or station name and press ENTER.
5. From station programming menu type item number for feature and press ENTER.
6. From prime intercom menu, type personal intercom number and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Idle Line Programming

Idle Line Preference

With you enable this feature, a station automatically connects to an idle line when the user lifts the telephone's handset.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. Fro COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

Idle Line Priority

If you give a station the ability to automatically connect to an idle assigned line when the user takes the handset off-hook, take this programming action to set the priority in which the system chooses the idle lines for use. You can place up to eight lines in this priority list.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type any eight line port numbers (type as n,nn,nnn or n–nnn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Ringing Line Preference

When you enable this feature, a station can automatically connect to a ringing line when a user takes his or her telephone off-hook.

1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) and press ENTER.
5. From the COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4–8 for each COS or press ESCAPE to end.

Dialing Mode

Program the line port to match either a DTMF tone or a rotary (pulse) dialing line as supplied by the central office (CO).

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number or name and press ENTER.
5. From line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting and press ENTER to accept setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each line port or press ESCAPE to end.

Pulse Dial Make/Pulse Dial Break (Pulse Dial Ratio)

Use this procedure to set the make/break ratio for rotary dial signalling to match rotary dial line requirements. You can set the line make/break ratio for rotary dial (pulse dial) signalling in a more flexible manner to match many different rotary dial line requirements. You can set the make time and the break time independently in one msec. increments to any time from one to 99 msec.

1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER,
4. From timing menu, type item number for line pulse make and press ENTER.
5. Type desired time (1–99) and press ENTER,
6. From timing menu, type item number for line pulse break and press ENTER.
7. Type desired time (1–99) and press ENTER.
8. Press ESCAPE twice,
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Pulse Dial Interdigit Time

You can set the interdigit time between dial pulses when the system pulse-dials a number over a line. The digital communications system defaults this time to 200 msec. and provides a range of timing values between 100 msec. and one sec. that you can set in 100 msec. increments.

1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER.
4. From timing menu type item number for feature and press ENTER.
5. Press SPACE bar to select desired time and press ENTER to select setting.
6. Press ESCAPE twice,
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Flexible Ringing Assignments

Program ringing assignments on a per station/per line/per intercom number basis. Ringing can be immediate, delayed, or special purpose. Use the procedures in this section to customize the ringing features for the system.

Direct Ringing

Use this procedure to choose the line ports that you want to ring at a station as soon as a call appears. Direct ringing sounds during the day 1 and day 2 time periods but does not ring during the night ringing mode or during the manual night transfer (of ringing) operation.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type the item number for feature and press ENTER.
6. Press CONTROL E for edit.
7. Type a for add or r for remove and press ENTER.
8. Type line port number (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

11 Repeat steps 4-10 for each station or press ESCAPE to end.

Delayed Ringing

Use this procedure to choose the line ports that you want to ring at a station after waiting a short time period from when a call appears. Delayed ringing sounds during day 1, day 2 time periods, during the night ringing mode, and during the manual night transfer (of ringing) operation.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add or r for remove and press ENTER.
8. Type line port number (type as n,nn,nnn or n—nnn) and press ENTER.
9. When finished, press ESCAPE twice.

Day 1 Ring

Use this procedure to choose the line ports that you want to ring at stations during the day 1 ringing mode time period. Refer to the paragraph below titled, Day 1, Day 2, and Night Ringing Begin and End Times, to set the beginning and ending times of this ringing.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
7. Type a for add or r for remove and press ENTER.
6. Press CONTROL E to edit.
8. Type line port number (n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each station or press ESCAPE to end.

Day 2 Ring

Use this procedure to choose the line ports that you want to ring at stations during the day 2 ringing mode time period. Refer to the paragraph below titled, Day 1, Day 2, and Night Ringing Begin and End Times, to set the beginning and ending times of this ringing.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E to edit.
7. Type a for add or r for remove and press ENTER.
8. Type line port number (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4-10 for each station or press ESCAPE to end.

Day 1, Day 2, And Night Ringing Begin And End Times

With this programming procedure, set the begin and end times of the day 1, day 2, and night ringing time periods.

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From the system parameters menu, select day 1, day 2 or night ringing begin times and press ENTER.
5. Type times in 24–hour format (hh:mm) and press ENTER.
6. Press ENTER (repeatedly if needed) to place cursor at next time desired setting.
7. Repeat step 5 and press ENTER.
8. Repeat steps 6 and 7 until all times are set and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4-10 for each station or press ESCAPE to end.

Night Ring (Night Transfer - Of Ringing)

Choose the line ports that you want to ring, along with the delayed ringing line ports, at stations during the night ringing mode of operation. The ringing arrangement that you configure here is the arrangement that is active both during the automatic night ringing time period and whenever the attendant manually activates the night transfer (of ringing) operation. Do note that the attendant commanded night ringing period supersedes the automatic night ringing period. Refer to the above paragraph titled, Day 1, Day 2, and Night Ringing Begin and End Times, to set the time for the automatic night ringing period.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add or r for remove and press ENTER.
8. Type line port number (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Ring No-Answer Rings

This procedure sets the amount of rings that sound at one station port before the call rolls over to ring at another station port. Any system feature that requires a ring no-answer value (for example, call forwarding) uses the setting that you program here.

The system defaults the ring no-answer value at regular station ports to four rings, and it defaults ports programmed to function as voice mail ports to three rings. This insure that, at default, the voice mail equipment will have sufficient time to answer a call before it rolls over to the next port.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type number of rings 0–6 and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Personalized Ringing Tone

Program a station to ring in one of several distinctive tones for proprietary digital telephones and in one of four distinctive tones for analog telephones.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu, type item number for feature and press ENTER.
6. Type ring tone choice and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

While industry-standard telephones do not provide personalized ringing, you can set distinctive ringing for them. An industry-standard telephone can sound one ring cadence for intercom calls and a different ring cadence for outside calls or it can sound the same ring cadence for both types of calls. You must select one of these ringing styles on a station class of service basis. All industry-standard telephones with the same class of service have the same ringing style.

NOTE: Do not enable distinctive ringing for voice mail ports.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service assigned to the IST and press ENTER.
5. From COS programming menu, type row number for IST distinctive ringing and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

Through Dialing (Thru-Dialing)

This procedure allows DTMF tones that are generated by an external device connected to the system through necessary interface equipment to pass through the system and out to any line connection.

1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

9 . Repeat steps 4–8 level for each station or press ESCAPE to end.

COMDIAL®

Installing And Programming The Off-Premise Extension Interface On The Digital Communications System

1.0 Introducing The Off-Premise Extension Interface

This publication describes the features, applications, installation, specifications, and operation of the off-premise extension interface (OPX-X). The OPX-X is a multipurpose accessory with dual circuits that provide the following features:

- OFF-PREMISE EXTENSION—This feature adapts most industry-standard telephone devices to the digital communications system and allows them to be remotely located. The OPX-X will accept both tone (DTMF) and pulse (rotary) dialing from these devices.
- TIE-LINE—This feature allows you to connect two systems to each other using single-pair wiring of dedicated telephone lines.
- MODEM ADAPTER—This feature allows the flow of switched data between a data source and a data receiver through the DXP Plus analog station ports.

The OPX-X is a dual off-premise extension (OPX) unit. It is housed in a self-contained metal enclosure that you can either wall or rack mount. The OPX-X has an internal power supply and ringing generator. Dual, high quality, low-loss, balanced, telephone transmission circuitry supports two off-premise extensions.

Each off-premise circuit can drive a load with a maximum ringer equivalence number (REN) of two (2) thus allowing more than one industry-standard telephone connection at each off-premise location if desired.

The OPX-X will support virtually any industry-standard telephone device such as 500 and 2500-type telephones, cordless telephones, answering machines, and data modems. The OPX-X provides the interfacing capability required to connect these devices to analog station ports in digital communications system.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising from the interpretation of the information contained herein. The information contained herein does not purport to cover all details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact Comdial, Inside Sales Department, Charlottesville, Virginia 22906.

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1.1 Detailing The Specifications

Electrical Specifications

Power requirements:	117VAC +/- 10% single-phase @ .13A maximum
Ringing voltage:	95 VAC Nominal @ 20 Hz Power rated to maximum REN = 2.0
Battery feed voltage:	50 VDC nominal
Loop current limits:	20 ma min. at 1500 ohms 50 ma max. at 0 ohms
DC loop limits:	1500 ohms maximum including telephony device (Approximately 20,000 feet with #24 AWG twisted-pair cable and 400 ohm device load)
Cable insulation resistance:	30,000 ohms minimum
Cable requirement OPX-X to digital communications system	2-pair, twisted
Cable terminations:	623-type, 4-conductor minijacks
Dialing:	Industry-standard DTMF Dial pulse (rotary) with nominal make/break ratio of 40/60 @ 10 PPS
Ringing cadence:	1 second on/4 seconds off (typical for intercom calls)

Environmental Specifications

Operating temperature:	32-122 F (0-50 C)
Humidity:	90 % relative, non-condensing

Mechanical Specifications

Height:	3.0 in.
Width:	10.25 in.
Length:	11.50 in.
Weight:	8 lbs. (plus 2 lbs. for packing material)

Industry/Regulatory Standards

FCC registered	Key System: CVW7WC-12829-KF-E Hybrid/Key System: CVW7WC-16553-MF-E
FCC certified, Part 15 (class A)	
UL listed	

Leased Line Specifications

Facility interface code:	0L13C
Line conditioning:	Dry metallic

2.0 Installing the Off-Premise Extension Interface

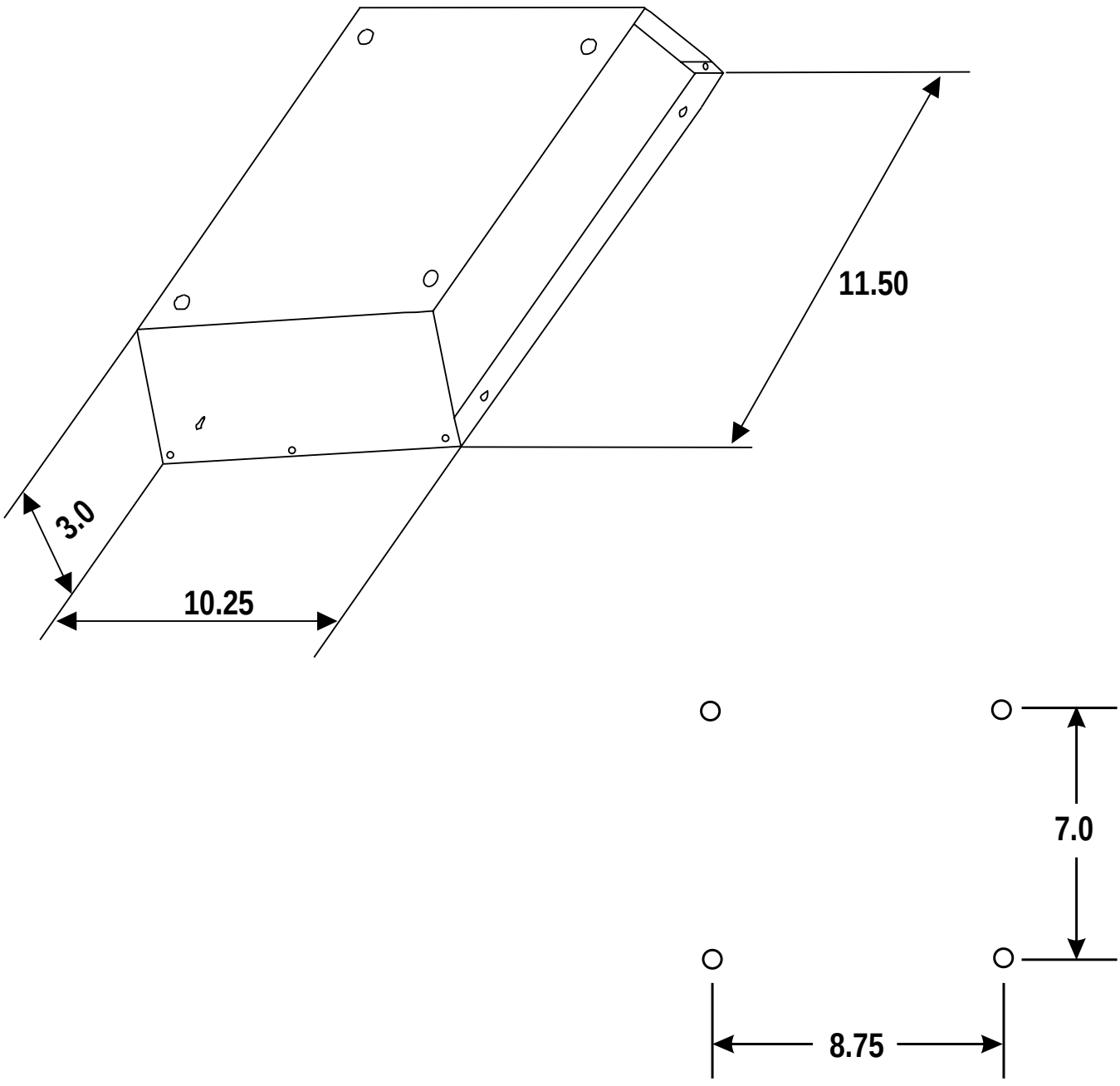
2.1 Detailing The Mounting Considerations

- You can attach the OPX-X to any sturdy, flat, surface. It may be vertically rack mounted if desired.
- you must locate the OPX-X within six (6) feet of the proper electrical outlet. It requires a 117VAC circuit, with a third-wire ground, supplied to a standard (NEMA 5-15R) electrical outlet.
- you must keep the distance between the OPX-X and the KSU to 25 feet or less.
- Be sure that the mounting location is secure and dry and have adequate ventilation. Be sure that the temperature range of the location is within 32-122° F (0-50° C).
- If the mounting surface is damp or if it is concrete or masonry material, you must attach a backboard to the mounting surface. Suitable mounting backboards are available commercially or can be constructed out of 1/2-inch plywood cut to size.
- Tools and hardware required for mounting the KSU cabinet include:
  - Fasteners - wood screws (1/4 x 1-inch round head), toggle bolts, or wall anchors.
  - Screwdriver - to match fasteners.
  - Electric drill - if prepared holes are required.
  - Connecting tool - for fastening wires to a type-66 connector block.
  - Crimping tool - for 623-type modular plugs.

2.2 Mounting The Cabinet

1. Unpack, and carefully inspect the OPX-X for shipping damage. Notify the shipper immediately of any damages found. Verify that the packages contain all parts and accessories needed for proper installation and operation.
2. If a backboard is required at the mounting location, attach it securely to provide a stable KSU mounting surface.
3. Use the base of the OPX-X as a template or measure for mounting hole locations per the dimension details shown in Figure 1.
4. Drill holes in the mounting surface of a proper size to accommodate the hardware being used. If necessary, prepare these holes with inserts, anchors or other attachment devices as dictated by the type of mounting surface.
5. Attach the OPX-X to the mounting surface with four (4) screws installed through the mounting flange and into the mounting surface holes. Note that the flange holes are elongated with an enlargement at one end of the hole. This feature allows the mounting screws to be partially installed in the mounting surface before the KSU is hung on them.

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Detailing The OPX-X Dimensions

2.3 Connecting The Equipment

- Route the necessary cabling, and connect the OPX-X to the digital communications system per the connections detailed on the next page.
- The installation requires a grounding wire separate from the third-wire AC line cord ground. The OPX-X cabinet provides a ground stud. Connect a #10 or #12, insulated, solid copper, wire between this ground stud and either the ground stud on the digital communications system cabinet or a reliable earth ground.
- Plug the AC line cord for the OPX-X into a 117 VAC outlet. Observe the status light on the unit, and insure that it turns on steady.

CAUTION

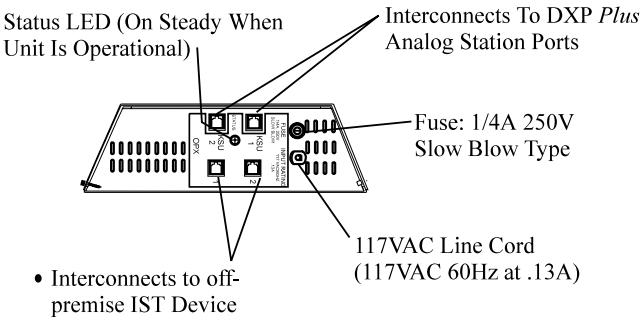
To help insure that foreign voltages, which could appear on the TELCO lines, do not damage the system, be sure gas discharge tubes or similar protection devices are installed, and properly grounded, in all connected TELCO lines.

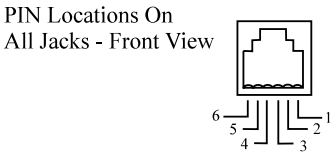
2.4 Verifying Proper Installation

Use a voltmeter to check for the presence of either AC or DC voltage on the OPX1 and OPX 2 ports.

Make these voltage measurements with all system wiring installed and the AC power turned off.

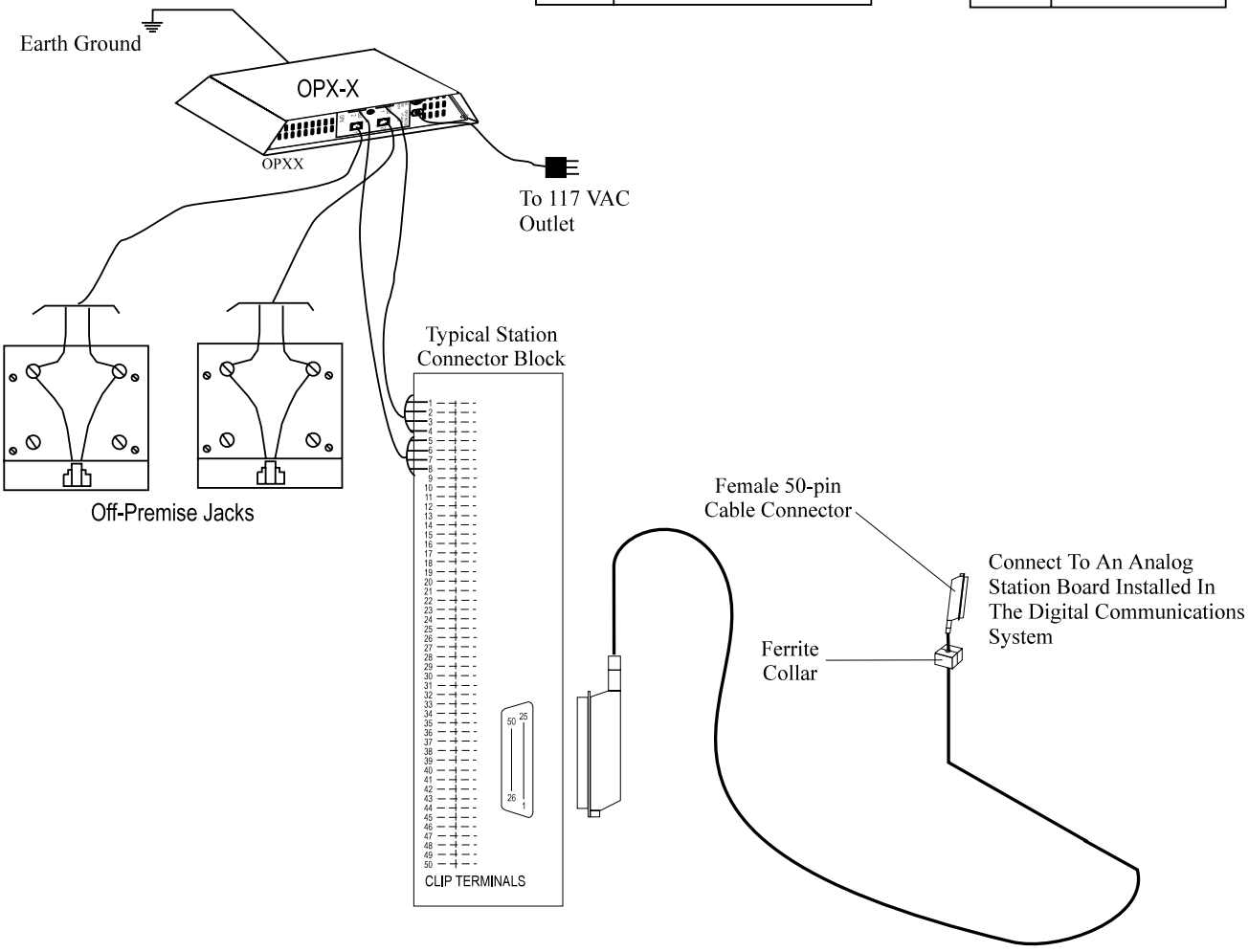
1. Measure for both AC and DC voltage between the TIP lead of the OPX 1 port and the KSU grounding stud. The measured voltage must be 0 volts.
2. Measure for both AC and DC voltage between the RING lead of the OPX 1 port and the KSU grounding stud. The measured voltage must be 0 volts.
3. Repeat steps 1 and 2 for the OPX 2 port.
4. Apply AC power to the OPX-X.
5. Repeat steps 1–3. The measured voltage must now be approximately -50VDC.


Status LED (On Steady When Unit Is Operational)
Interconnects To DXP *Plus* Analog Station Ports
Fuse: 1/4A 250V Slow Blow Type
117VAC Line Cord (117VAC 60Hz at .13A)
• Interconnects to off-premise IST Device
• Interconnects to tip and ring of a dry metalic telephone line



Common Equipment Jacks 1&2	
PIN 1	No Connection
PIN 2	Data 1
PIN 3	Voice 1
PIN 4	Voice 2
PIN 5	Data 2
PIN 6	No Connection

OPX Jacks 1 & 2	
PIN 1	No Connection
PIN 2	No Connection
PIN 3	Tip
PIN 4	Ring
PIN 5	No Connection
PIN 6	No Connection



Connecting The Equipment

2.5 Setting The Configuration Switches

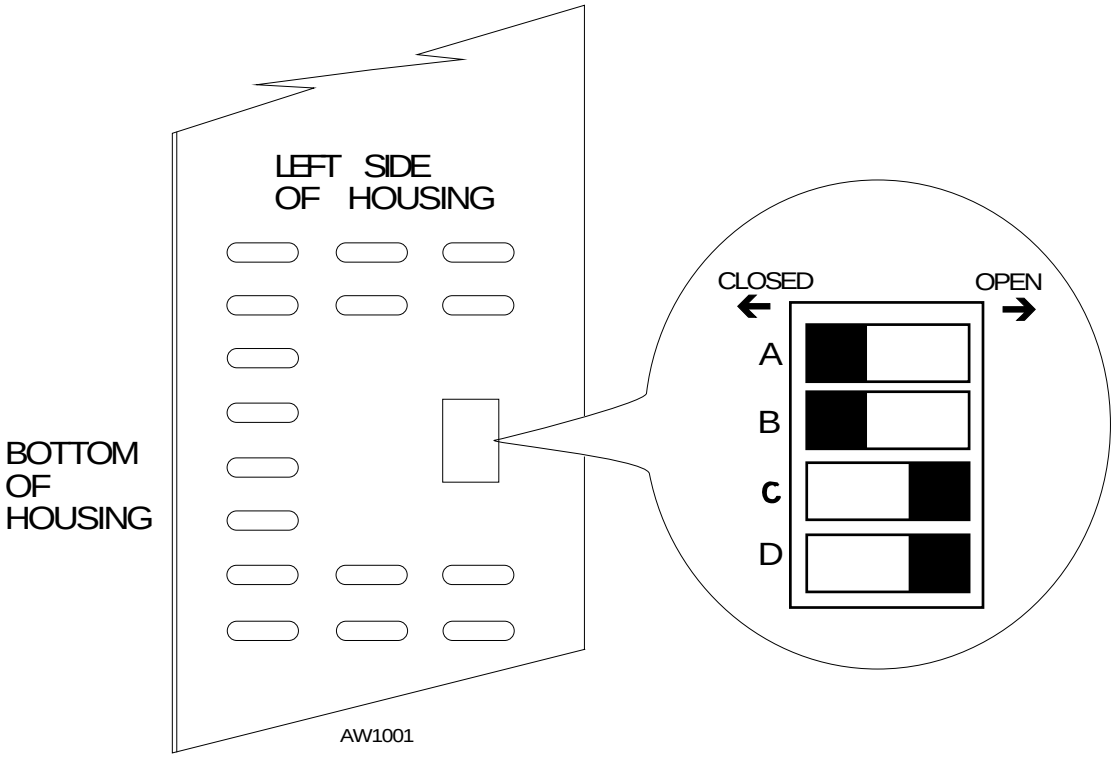
You must set the OPX-X's configuration switches to match the digital communications system. The switches are located in an opening on the left side of the cabinet.

Setting The Configuration Switches				
Switch	**System Condition**			**Setting**
A	System programmed to assign analog station port to OPX-X for circuit 1		Yes	Closed
			No	Open*
B	System programmed to assign analog station port to OPX-X for circuit 2		Yes	Closed
			No	Open*
C	Key- System Configured with . .	Voice first intercom signalling enabled **(note 1)**		Closed*
		Tone first intercom signalling enabled		Open
		Prime line automatic enabled		Open
	Hybrid system configured			Open
D (note 2)	Off-premise device is intercom only			Closed*
	Off-premise device has access to outside line through the digital communications system			Open

NOTE 1: This switch setting matches the system requirements. It is not possible to perform voice signalling from a device connected through an OPX-X to the common equipment.

NOTE 2: When you have programmed the system to allow the off-premise device to have access to outside line, you must also enable a signal delay to prevent transmission of extraneous DTMF tones from the device over the outside line. When you enable this delay, the user must wait approximately 2 seconds before speaking when performing call announce and paging over intercom line. When the off-premise device is an intercom only device with no access to an outside line, you can disable the delay to facilitate faster cut-through to call announce and paging.

*Factory settings



Locating The Switches

3.0 Programming For Off Premise Extension Interface Operation

When operated through the OPX-X, the IST provides basic intercom service coupled with the ability to access outside lines. You can program the analog station port (through which the IST is being interfaced via the OPX-X) for either **prime intercom** operation or **prime line automatic and idle line preference** operation. Default is for prime intercom. Under either operating condition, you can program the station port to receive outside line ringing and to match either the rotary or DTMF dialing employed by the IST.

3.1 Detailing The Prime Intercom Operating Condition

With key-system configured digital communications systems, a system multiline telephone user can extend line access for call origination to an IST station by employing the call transfer feature. To provide outside line ringing to a prime intercom IST, program the OPX-X station port to have the ringing line preference feature and then enable ringing for all lines that you want to ring at the IST.

With hybrid configured digital communications systems, you can make outside lines available to the IST for call origination by programming the IST for line group access. With line group access, the IST user can access an outside line by dialing the group access code over the intercom line. The digital communications system then selects one of the grouped lines for IST use.

3.2 Detailing The Prime Line Automatic Or Idle Line Preference Operating Condition

You can program an outside line as a prime line at the station port through which the IST is being interfaced, or you can program that station port for idle line preference and then assign several lines to the station port.

With either prime line automatic or idle line preference, the IST has outside line dial tone for call origination when its user lifts its handset. You can enable outside line ringing at the IST station port that you have programmed for either prime line automatic or idle line preference. Alternately, you can enable the ringing line preference feature for the IST station port.

The intercom line is still available to an IST even though you have provided outside line access. After going off-hook, the IST user obtains intercom dial tone by performing a hookflash (press and release the hookswitch) or by pressing the TAP button if one is available. Hookflash either drops the outside line (if the used dialed no digits after lifting the handset) or (if the user dialed some digits) places the line on hold and provides intercom dial tone.

3.3 Detailing The Distinctive Ringing Condition

Intercom calls that ring at equipment connected through an OPX-X have a different cadence than outside calls have. If desired, you can disable this distinctive ringing feature to make the intercom ring cadence the same as that for outside calls.

3.4 Detailing The Through Dialing Condition

You can program the station port through which the IST is being interfaced for through-dialing or you can disable the feature. The system automatically enables the feature when you connect an OPX-X to the station port. Through dialing enabled is necessary if the connected IST is a dual-tone multifrequency (DTMF) tone dial device that requires that its generated dialing tones pass through the OPX-X, the common equipment, and onto a tone dial compatible telephone line.

If the IST is a rotary telephone, you must disable the through dialing feature.

3.5 Programming Procedures

The OPX-X automatically identifies itself as an analog terminal interface for the digital station board as soon as you connect it to the digital communications system.

Prime Line Programming

Prime Line Type

When you enable this feature, the station automatically selects a line, line group, or intercom number for use when the station user takes the station off hook. Use the programming procedures shown below to select the line port, line group, or intercom number to serve as the prime station calling interface.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE BAR for desired value and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Prime Line

Use this procedure to choose the prime line.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or station name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. From prime line menu, type line port number (type as n,nn,nnn or n–nnn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Prime Intercom Number

Use this procedure to choose the prime intercom number.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or station name and press ENTER.
5. From station programming menu type item number for feature and press ENTER.
6. From prime intercom menu, type personal intercom number and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Idle Line Programming

Idle Line Preference

With you enable this feature, a station automatically connects to an idle line when the user lifts the telephone's handset.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. Fro COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

Idle Line Priority

If you give a station the ability to automatically connect to an idle assigned line when the user takes the handset off-hook, take this programming action to set the priority in which the system chooses the idle lines for use. You can place up to eight lines in this priority list.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type any eight line numbers (type as n,nn,nnn or n–nnn) and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

Ringing Line Preference

When you enable this feature, a station can automatically connect to a ringing line when a user takes his or her telephone off-hook.

1. Press CONTROL T for main menu.
2. From the main menu, select stations and press ENTER.
3. From the stations menu, select COS programming and press ENTER.
4. Type class of service number (1-32) and press ENTER.
5. From the COS programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each COS or press ESCAPE to end.

Dialing Mode

Program the line port to match either a DTMF tone or a rotary (pulse) dialing line as supplied by the central office (CO).

1. Press CONTROL T for main menu.
2. From main menu, select lines and press ENTER.
3. From lines menu, select line programming and press ENTER.
4. Type line port number or name and press ENTER.
5. From line programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for feature setting and press ENTER to accept setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each line port or press ESCAPE to end.

Pulse Dial Make/Pulse Dial Break (Pulse Dial Ratio)

Use this procedure to set the make/break ratio for rotary dial signalling to match rotary dial line requirements. You can set the line make/break ratio for rotary dial (pulse dial) signalling in a more flexible manner to match many different rotary dial line requirements. You can set the make time and the break time independently in one msec. increments to any time from one to 99 msec.

1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From system menu, select timing and press ENTER,
4. From timing menu, type item number for line pulse make and press ENTER.
5. Type desired time (1–99) and press ENTER,
6. From timing menu, type item number for line pulse break and press ENTER.
7. Type desired time (1–99) and press ENTER.
8. Press ESCAPE twice,
9. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Pulse Dial Interdigit Time

You can set the interdigit time between dial pulses when the system pulse-dials a number over a line. The digital communications system defaults this time to 200 msec. and provides a range of timing values between 100 msec. and one sec. that you can set in 100 msec. increments.

1. Press CONTROL T for main menu,
2. From main menu, select system and press ENTER.
3. From the system menu, select timing and press ENTER.
4. From timing menu type item number for feature and press ENTER.
5. Press SPACE bar to select desired time and press ENTER to select setting.
6. Press ESCAPE twice,
7. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Flexible Ringing Assignments

Program ringing assignments on a per station/per line/per intercom number basis. Ringing can be immediate, delayed, or special purpose. Use the procedures in this section to customize the ringing features for the system.

Direct Ringing

Use this procedure to choose the line ports that you want to ring at a station as soon as a call appears. Direct ringing sounds during the day 1 and day 2 time periods but does not ring during the night ringing mode or during the manual night transfer (of ringing) operation.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type the item number for feature and press ENTER.
6. Press CONTROL E for edit.
7. Type a for add or r for remove and press ENTER.
8. Type line port number (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

11 Repeat steps 4-10 for each station or press ESCAPE to end.

Delayed Ringing

Use this procedure to choose the line ports that you want to ring at a station after waiting a short time period from when a call appears. Delayed ringing sounds during day 1, day 2 time periods, during the night ringing mode, and during the manual night transfer (of ringing) operation.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add or r for remove and press ENTER.
8. Type line port number (type as n,nn,nnn or n—nnn) and press ENTER.
9. When finished, press ESCAPE twice.

Day 1 Ring

Use this procedure to choose the line ports that you want to ring at stations during the day 1 ringing mode time period. Refer to the paragraph below titled, Day 1, Day 2, and Night Ringing Begin and End Times, to set the beginning and ending times of this ringing.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
7. Type a for add or r for remove and press ENTER.
6. Press CONTROL E to edit.
8. Type line port number (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4–10 for each station or press ESCAPE to end.

Day 2 Ring

Use this procedure to choose the line ports that you want to ring at stations during the day 2 ringing mode time period. Refer to the paragraph below titled, Day 1, Day 2, and Night Ringing Begin and End Times, to set the beginning and ending times of this ringing.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E to edit.
7. Type a for add or r for remove and press ENTER.
8. Type line port number (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4-10 for each station or press ESCAPE to end.

Day 1, Day 2, And Night Ringing Begin And End Times

With this programming procedure, set the begin and end times of the day 1, day 2, and night ringing time periods.

1. Press CONTROL T for main menu.
2. From main menu, select system and press ENTER.
3. From system menu, select system parameters and press ENTER.
4. From the system parameters menu, select day 1, day 2 or night ringing begin times and press ENTER.
5. Type times in 24–hour format (hh:mm) and press ENTER.
6. Press ENTER (repeatedly if needed) to place cursor at next time desired setting.
7. Repeat step 5 and press ENTER.
8. Repeat steps 6 and 7 until all times are set and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
11. Repeat steps 4-10 for each station or press ESCAPE to end.

Night Ring (Night Transfer - Of Ringing)

Choose the line ports that you want to ring, along with the delayed ringing line ports, at stations during the night ringing mode of operation. The ringing arrangement that you configure here is the arrangement that is active both during the automatic night ringing time period and whenever the attendant manually activates the night transfer (of ringing) operation. Do note that the attendant commanded night ringing period supersedes the automatic night ringing period. Refer to the above paragraph titled, Day 1, Day 2, and Night Ringing Begin and End Times, to set the time for the automatic night ringing period.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press CONTROL E.
7. Type a for add or r for remove and press ENTER.
8. Type line port number (type as n,nn,nnn or n–nnn) and press ENTER.
9. When finished, press ESCAPE twice.
10. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.

Ring No-Answer Rings

This procedure sets the amount of rings that sound at one station port before the call rolls over to ring at another station port. Any system feature that requires a ring no-answer value (for example, call forwarding) uses the setting that you program here.

The system defaults the ring no-answer value at regular station ports to four rings, and it defaults ports programmed to function as voice mail ports to three rings. This insure that, at default, the voice mail equipment will have sufficient time to answer a call before it rolls over to the next port.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Type number of rings 0–6 and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.



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Personalized Ringing Tone

Program a station to ring in one of several distinctive tones for proprietary digital telephones and in one of four distinctive tones for analog telephones.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name and press ENTER.
5. From the station programming menu, type item number for feature and press ENTER.
6. Type ring tone choice and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Repeat steps 4-8 for each station or press ESCAPE to end.

While industry-standard telephones do not provide personalized ringing, you can set distinctive ringing for them. An industry-standard telephone can sound one ring cadence for intercom calls and a different ring cadence for outside calls or it can sound the same ring cadence for both types of calls. You must select one of these ringing styles on a station class of service basis. All industry-standard telephones with the same class of service have the same ringing style.

NOTE: Do not enable distinctive ringing for voice mail ports.

1. Press CONTROL T for main menu.
2. From main menu, select stations and press ENTER.
3. From stations menu, select COS programming and press ENTER.
4. Type class of service number (1–32) that corresponds with class of service assigned to the IST and press ENTER.
5. From COS programming menu, type row number for IST distinctive ringing and press ENTER.
6. Press SPACE bar for feature setting.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9. Press ESCAPE to end.

Through Dialing (Thru-Dialing)

This procedure allows DTMF tones that are generated by an external device connected to the system through necessary interface equipment to pass through the system and out to any line connection.

1. Press CONTROL T for main menu.
2. From main menu, select station and press ENTER.
3. From station menu, select station programming and press ENTER.
4. Type personal intercom number or previously assigned name of station being programmed and press ENTER.
5. From station programming menu, type item number for feature and press ENTER.
6. Press SPACE bar for desired setting and press ENTER.
7. When finished, press ESCAPE twice.
8. Type y to accept changes, n to reject them, or r to resume editing and press ENTER.
9 . Repeat steps 4–8 level for each station or press ESCAPE to end.

Comdial's Quality Management System Is Certified To The ISO 9001 Standard.

COMDIAL®

TECHNICAL ADVISORY BULLETIN

Date: January 1997 Issue: TAB011–DXP

Software Enhancements For The DXP Digital Communications System

This bulletin discusses the following software enhancements and feature additions to the DXP digital communications system that are available with software release 9C.

- Impression Telephone Support,
- End to End Signaling for IST Doorbox Support,
- Toll / ARS Programming Enhancements.

NOTE: It is always a good practice to save the data base for backup purposes before you up-grade the system software revision.

The pages of this TAB011–DXP present the 9C software revision information as separate sheets that, if you wish, you can insert in your DXP manuals.

Printed in U.S.A.

This manual has been developed by Comdial Corporation (the "Company") and is intended for the use of its customers and service personnel. The information in this manual is subject to change without notice. While every effort has been made to eliminate errors, the Company disclaims liability for any difficulties arising for the interpretation of the information contained herein.
The information contained herein does not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes contact, Comdial, Inside Sales Department, P.O. Box 7266, Charlottesville, Virginia 22906.

2 Describing The Telephone Features

2.1 Using The Comdial Telephones

The DXP supports many of Comdial's proprietary telephones as well as industry-standard telephones. The following list details the various telephone models.

- **DigiTech Telephones**
  - » 7700S —LCD Speakerphone
  - » 7701X —Single Line Proprietary Telephone
  - » 7714S —Multiline Speakerphone
  - » DD32X —32-Button DSS/BLF
  - » 7714X —Multiline Telephone

- ***Impact* Telephones**
  - » 8024S —24-Line LCD Speakerphone
  - » 8124S —24-Line Speakerphone
  - » 8012S —12-Line LCD Speakerphone
  - » 8112S —12-Line Speakerphone
  - » 8112N —Multiline Proprietary Telephone
  - » IB64X —DSS/BLF Console
  - » 8101N —Single Line Proprietary Telephone

9C Software

Impression Telephones

- 2022S —22-Line LCD Speakerphone
- 2122S —22-Line Speakerphone
- 2122X —22-Line Monitor Telephone
- 2101N —Single Line Proprietary Telephone
- DU32X —32-Button DSS/BLF Console

- **ExecuTech Telephones**
  - » 6620E —23-Line Monitor Telephone
  - » 6620T —23-Line Speakerphone
  - » 6614E —22-Line Monitor Telephone
  - » 6614T —22-Line Speakerphone
  - » 6600E —17-Line LCD Speakerphone
  - » 6700S —12-Line LCD Speakerphone
  - » 6701X —Single Line Proprietary Telephone
  - 6706X —6-Line Monitor Telephone
  - 6714S —14-Line Monitor Telephone
  - DB70 —70-Button DSS/BLF
  - DB32S —32-Button DSS/BLF
  - EB32X —32-Button DSS/BLF

2.2 Understanding The Telephone Features

The DXP supports the following telephone features on both analog and digital proprietary telephones. Some of these features are system-wide and others are specific to individual stations.

Alphanumeric Display

- Displays time, day, and date
- Keeps you apprised of the status of your telephone
- Provides programming prompts

Auxiliary Jack (used only with *Impact* and DigiTech LCD Speakerphone)

- Allows you to use your telephone privately and handsfree with headset
- Allows you to plug in a tape recorder
- Allows you to plug in a loud ringer
- Helps improve operation of high-volume business applications by adding a paging speaker

Button Query

- Allows you to see the function of a programmed button on your LCD screen

Hold Button

- Places a line on hold
- Stores pauses in number sequences while programming
- Allows you to scroll through multiple held calls on display

Interactive Buttons

- Provide quick and easy access to system and call processing features
- Provide straightforward button programming without dialing codes (the interactive buttons are not programmable)

Intercom Button

- Selects an intercom line
- Initiates many of the features of the telephone

Message Waiting Light

- Tells you there is a message for you

Mute Button

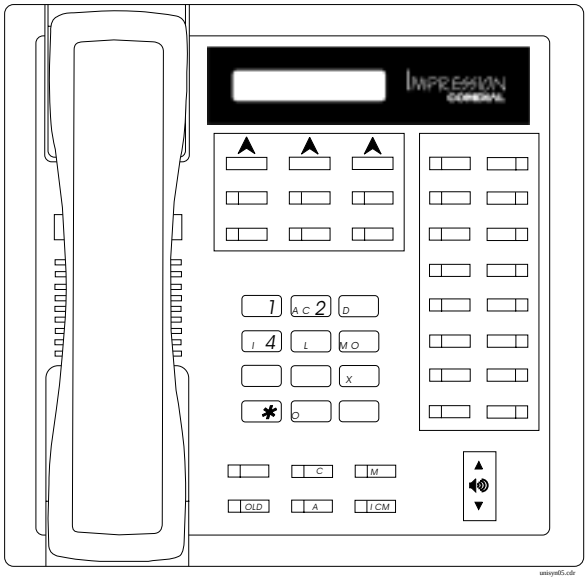
- Keeps the person on the line or speakerphone from hearing your conversation

Programmable Buttons

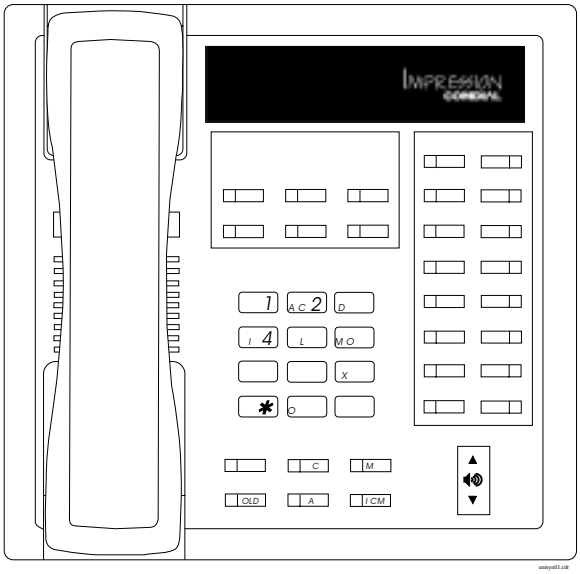
- Allow you to program your telephone for automatic dialing functions
- Allow you to program your telephone for Direct Station Selection (DSS)
- Show which lines and intercoms are either in use or on hold
- Allow you to store frequently used feature codes at unused buttons

2.6 Using Impression Telephones

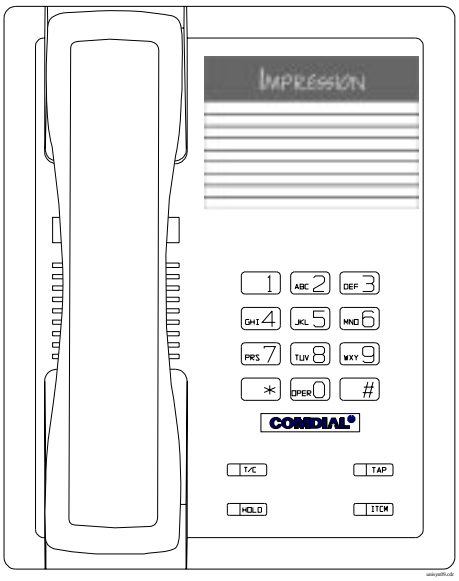
DXP software 9C supports Comdial Impression telephones.



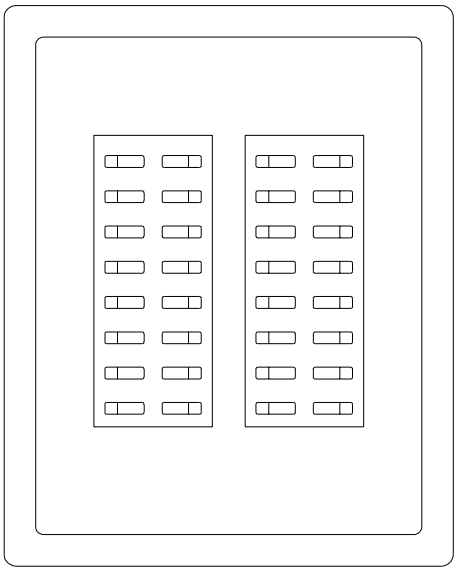
2022S (22-Line LCD Speakerphone)



2122S (22-Line Speakerphone)
2122X (22-Line Monitor Telephone)

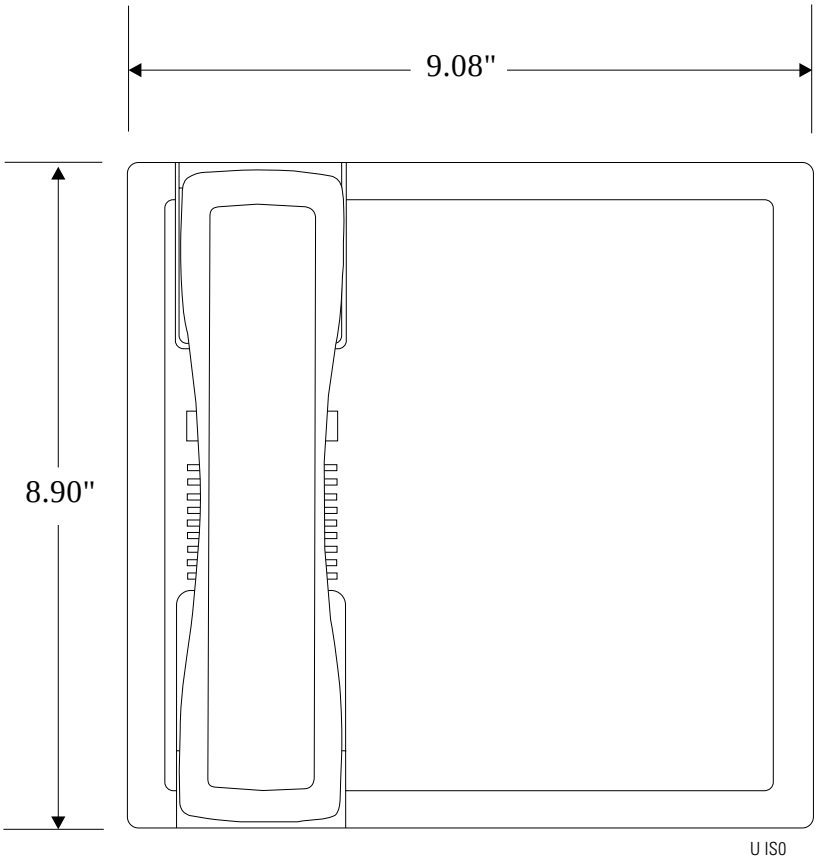


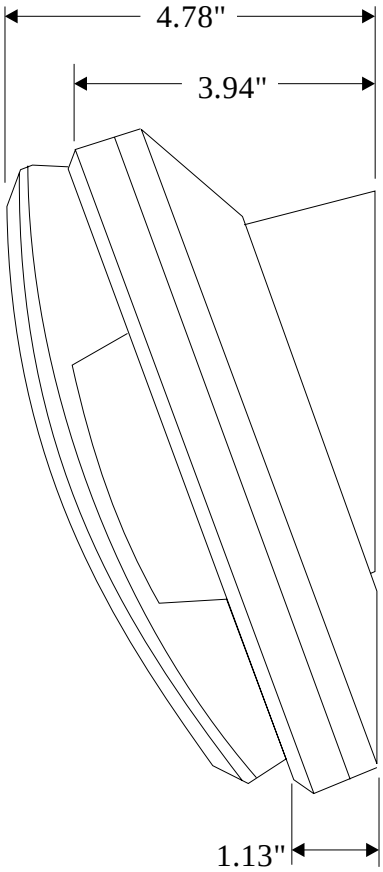
2101N (Single Line Proprietary Telephone)

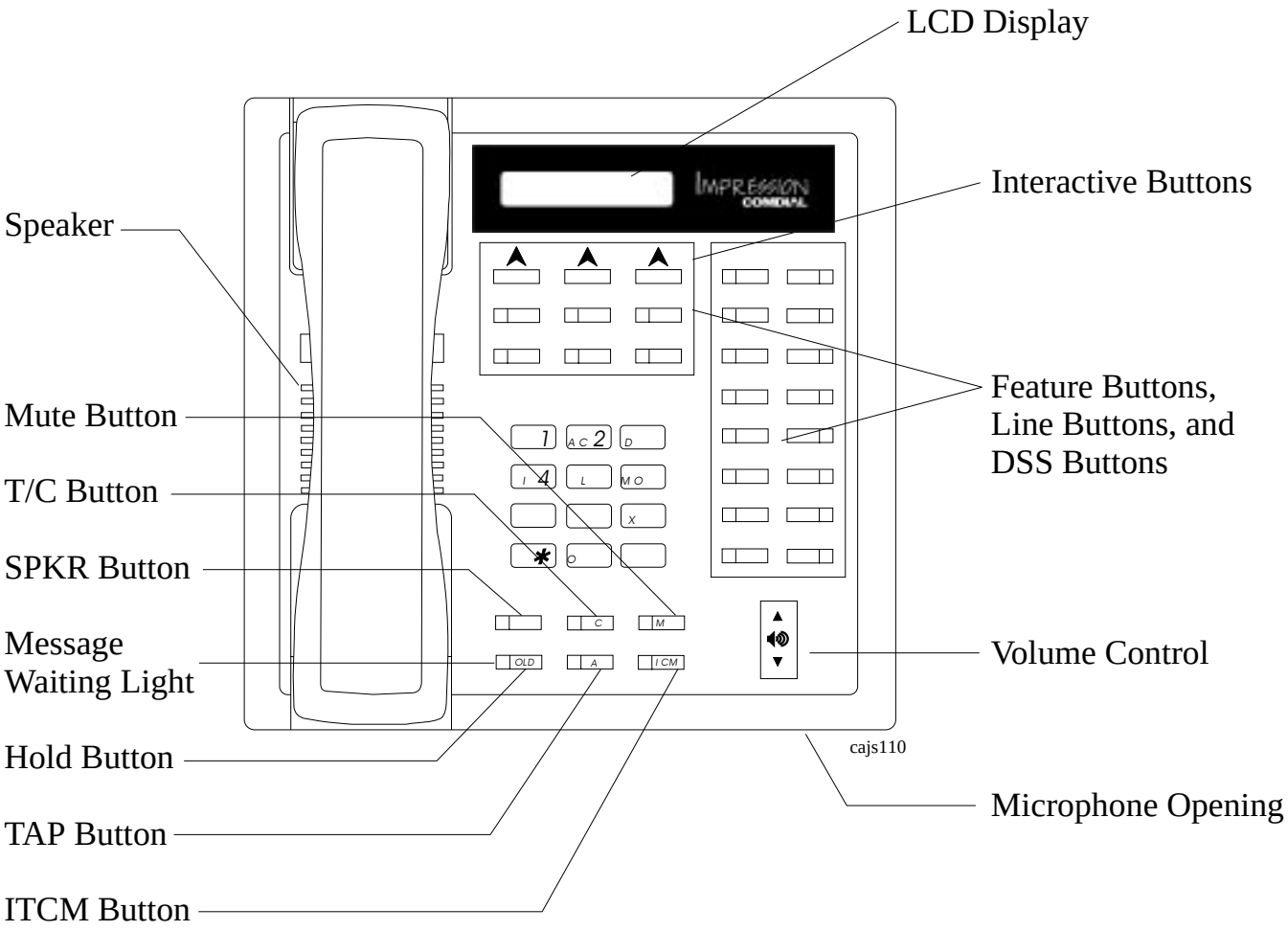


DU32X (32-Button DSS/BLF Console)

unisyn11.cdr


9.08"
8.90"
U IS0


4.78"
3.94"
1.13"


LCD Display
Interactive Buttons
Speaker
Feature Buttons,
Line Buttons, and
DSS Buttons
Mute Button
T/C Button
SPKR Button
Message
Waiting Light
Volume Control
Hold Button
TAP Button
ITCM Button
Microphone Opening
cajs110

6 Understanding The Features

6.1 DXP Features List

- ☐ Abandoned Hold Release
- ☐ Adjunct Feature Module
- ☐ Access Denied
- ☐ Account Code Button
- ☐ Account Codes With Positive Verification
- ☐ All Call Paging
- ☐ Allow Ringer Off *(Ringer Volume Off)*
- ☐ Alpha-Numeric Calling Party and Line Display
- ☐ Alternate Attendant
- ☐ Answer Button
- ☐ Area Paging Interface
- ☐ Attendant Position
- ☐ Attendant Position, PC
- ☐ Authorization Code
- ☐ Automatic Dialing
- ☐ Automatic Hold - Intercom To Intercom/Line
- ☐ Automatic Hold - Line To Intercom
- ☐ Automatic Hold - Line To Line
- ☐ Automatic Pause Insertion
- ☐ Automatic Privacy
- ☐ Automatic Number Identification (ANI)
- ☐ Automatic Redial
- ☐ Automatic Reports
- ☐ Automatic Route Selection
- ☐ Automatic Station Relocation
- ☐ Auxiliary Equipment Interface
- ☐ Auxiliary Station Ringer Interface
- ☐ Background Music*
- ☐ Battery Backup (Chassis, Cable, and Batteries)
- ☐ Battery Backup Interface
- ☐ Block Programming
- ☐ Busy Button Inquiry
- ☐ Busy On SOHVA
- ☐ Button Query
- ☐ Call Announce Beeps
- ☐ Call Announce With Handsfree Answerback
- ☐ Call Costing and SMDA Reports
- ☐ Call Forward - All Or Personal
- ☐ Call Forward- Immediate
- ☐ Call Forward - Busy Or RNA, All Or Personal
- ☐ Call Park
- ☐ Call Park Recall
- ☐ Call Pick-Up - Directed
- ☐ Call Pick-Up - Group
- ☐ Call Pick-Up - System
- ☐ Call Transfer - Screened
- ☐ Call Transfer - Unscreened With Automatic Camp On
- ☐ Call Waiting Tone
- ☐ Caller ID
- ☐ Caller ID–RNA
- ☐ Camp-On With Automatic Call Back
- ☐ Camp-On - Call Waiting
- ☐ Camp-On - No Answer
- ☐ Clear Major Alarm Ring
- ☐ Central Message Desk
- ☐ Central Processor Switched Data Port Configuration
- ☐ Centrex Compatible
- ☐ Common Audible Ringer Interface
- ☐ Conference Advisory Tone
- ☐ Conferencing - Multiline
- ☐ Console Support
- ☐ Console-Less Operation
- ☐ Communications Card Support
- ☐ Consultation Hold
- ☐ Copy Model
- ☐ Data Base Program Storage Via PC Interface
- ☐ Data Base Programming From Main Station (Limited)
- ☐ Data Base Programming With Personal Computer And Visual Man Machine Interface (VMMI) Software
- ☐ Day One and Day Two Ringing
- ☐ Default Busy/RNA Call Forward
- ☐ Default Functional Programming
- ☐ Delayed Ringing
- ☐ Dial 0 for System Attendant
- ☐ Dial Plus Interdigit Time
- ☐ Digital Voice Announce
- ☐ Dialed Number Identification Service (DNIS)
- ☐ Digital Wireless Telephone Support
- ☐ Direct Inward Dialing (DID)
- ☐ Direct Inward System Access (DISA)
- ☐ Direct Line Access by Station
- ☐ Direct Line Group Selection
- ☐ Directed Station Hold
- ☐ Disconnect Supervision
- ☐ Discriminating Ringing
- ☐ Do Not Disturb
- ☐ Do Not Disturb Inhibit
- ☐ Do Not Disturb Override
- ☐ DSS Status Button
- ☐ Dynamic Save Button
- ☐ E&M tie Line support
- ☐ End to End DTMF Signaling
- ☐ End to End Signaling on Intercom**
- ☐ End to End Signaling on Lines
- ☐ Enhanced LCD Display
- ☐ Exclusive Hold
- ☐ Executive Override
- ☐ Executive Override Block
- ☐ Executive Override Advisory Tone
- ☐ Extended DTMF Tones

- ☐ Existing Comdial Telephone Support
- ☐ ExecuMail Integration
- ☐ External Paging Interface
- ☐ Feature Inhibit
- ☐ Feature Renumbering
- ☐ Flexible Ringing Assignment
- ☐ Flexible Ringing Assignment Of The External Paging Port
- ☐ Flexible Station Numbering Plan
- ☐ Ground Start Lines
- ☐ Group Intercoms
- ☐ Handsfree Answer Inhibit
- ☐ Handset Volume Control
- ☐ Headset Capability
- ☐ Hold
- ☐ Hold, Exclusive
- ☐ Hold Queuing
- ☐ Hold Time Reporting
- ☐ Hot Transfer
- ☐ I Hold and I Use Indications
- ☐ Idle Line Preference
- ☐ Idle Line Priority
- ☐ Industry Standard Telephone Support
- ☐ IST Offhook Treated As Busy
- ☐ IST Message Wait Retrieval Access Code
- ☐ IST Ring Frequency
- ☐ IST Ring Patterns
- ☐ Interactive Button Support
- ☐ Intercom Call Progress Tones
- ☐ Intercom Hunt List
- ☐ Intercom Interdigit Dialing Time-out
- ☐ Intercom Time-out
- ☐ Intercom Number
- ☐ Key/Hybrid Configuration
- ☐ Last Number Redial
- ☐ Line Access Restriction
- ☐ Line Answer From Any Station
- ☐ Line Appearance, Enhanced
- ☐ Line Groups
- ☐ Line Group Access
- ☐ Line Names
- ☐ Line Out Softkey Option
- ☐ Line Queuing
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- ☐ Liquid Crystal Display (LCD) Support
- ☐ Location Code
- ☐ Lock Button
- ☐ Manual Exclusion
- ☐ Manual Reset
- ☐ Master Clear
- ☐ Maximum Call Duration
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- ☐ Message Deposit
- ☐ Message Waiting
- ☐ Mnemonic Programming
- ☐ Modem Support
- ☐ Modify Digits Table
- ☐ Multiple Attendant Positions
- ☐ Multipurpose Line Board
- ☐ Music Interface*
- ☐ Music On Hold*
- ☐ Mute
- ☐ Names (Stations And Lines)
- ☐ Night Service Automatic Switching
- ☐ Night Transfer (Of Ringing)
- ☐ Off-Premise Extension (OPX)
- ☐ On-Hook Dialing
- ☐ Operator Station
- ☐ Originating Denied
- ☐ Out Dial Delay Time
- ☐ Password Protection
- ☐ Pause Time
- ☐ PBX/Centrex/Central Office Compatible
- ☐ Personal Intercom Number
- ☐ Paging Access
- ☐ Periodic Line Tone
- ☐ Personal Intercom Number Preference
- ☐ Personalized Ringing Tone
- ☐ Pooled Line Access
- ☐ Power Failure Transfer
- ☐ Preselection Prime Line
- ☐ Printer Interface
- ☐ Privacy
- ☐ Privacy Release
- ☐ Private Lines
- ☐ Program Printout
- ☐ Programmable Button Flexibility
- ☐ Programming Port
- ☐ Pulse/Tone Switchable
- ☐ Quick Transfer
- ☐ Remote Programming and Diagnostics
- ☐ Remote Station Disable
- ☐ Release Button
- ☐ Reminder Alert
- ☐ Restrict ARS Hookflash *(Automatic Route Selection, Hookflash Restriction)*
- ☐ Restricted Dial Error Tone
- ☐ Response Messaging
- ☐ Ringback On Busy
- ☐ Ringback On Transfer
- ☐ Ring Back Tone
- ☐ Ring No Answer Call Forward
- ☐ Ring On Busy
- ☐ Ringing Line Preference
- ☐ Save Button Dial Storage
- ☐ Saved Number Redial
- ☐ Secure Account Code Display
- ☐ Self Diagnostics
- ☐ Serial Data Port
- ☐ Service Observing
- ☐ Shift Button
- ☐ Silent Mode Button
- ☐ Single-Line Proprietary Telephone Support
- ☐ SMDA Reports
- ☐ SOHVA Beeps *(SOHVA Tone Bursts)*
- ☐ Speakerphone Support
- ☐ Split Button
- ☐ Square/Non-Square Configuration
- ☐ Station Hunting
- ☐ Station Class Of Service
- ☐ Station Message Detail Accounting (SMDA)
- ☐ Station Message Detail Recording (SMDR)
- ☐ Station Monitoring with DSS Call Pickup
- ☐ Station Names
- ☐ Station Speed Dial
- ☐ Subdued Off-Hook Voice Announce
- ☐ Subdued Off-Hook Voice Announce Groups
- ☐ Subdued Ringing
- ☐ Synchronized Ringing
- ☐ System Clock
- ☐ System Speed Dial
- ☐ System Status Reports
- ☐ T1 Digital Carrier Transmission Option
- ☐ Tap (Flash)/Recall
- ☐ Telephony Services Application Programming Interface (TSAPI) Support
- ☐ Through Dialing
- ☐ Tie Lines
- ☐ Time And Date
- ☐ Timed And Immediate Recall
- ☐ Toll / ARS Programming Enhancements**
- ☐ Toll Restriction
- ☐ Toll Restriction Pause Entries
- ☐ Tone or Voice Signaling on Internal Calls
- ☐ Transfer/Conference Button
- ☐ Transfer Ring Cadence
- ☐ Unsupervised Conference
- ☐ Voice Announce Blocking
- ☐ Voice Mail Integration Digits
- ☐ Zone Paging

** The system is equipped with two inputs for separate customer-supplied music sources.*

***DXP 9C features.*

End-to-End Signaling On Intercom

After establishing an intercom call, the system can continue to send and receive dialing signals (DTMF tones) through the intercom path. Use station parameter programming to set the extension to receive DTMF digits. End-to-End signaling can be enabled on any station port and is useful when connecting devices which utilize DTMF tones. Voice mail ports do not require this setting since they are identified by their presence in the link table.

11 Programming Toll Restriction

- Toll Restriction Example 1 . . . . . 11.1
- Toll Restriction Example 2 . . . . . 11.2
- Toll Restriction Flow Diagram 11.3
- Restriction Level Programming 11.4
- Toll Groups Programming 11.5
- Restricted Numbers Programming 11.6
- Exception Number Programming 11.7

With the toll restriction feature, the system allows or denies outgoing line calls to selected users over selected lines. Toll restriction meets different dialing needs by allowing users to dial numbers they are required to dial yet restrict them from dialing numbers they are not allowed to dial. A defaulted system allows station users to dial any number they choose to dial. When programming the various aspects of toll restriction, use the planning sheets provided in IMI66-110, *Programming Records For The DXP Digital Communications System*. The dialing option table provides for not only toll restriction but also automatic route selection and call costing features. Each of these features may be used separately, together, or not used at all. For an overview illustration of toll restriction, refer *Section 11.3* Assign toll restriction in the sequence detailed below.

NOTE: DXP Software Release 9C allows no programming changes on Toll/ARS numbers unless the system-wide setting for ARS is turned off. If ARS is enabled, the Toll/ARS numbers are viewable in read-only mode.

Step 1. Program the restriction level (Section 11.4).
Step 2. Program the toll groups (Section 11.5).
Step 3. Program the restriction numbers (Section 11.6).
Step 4. Program the exception numbers (Section 11.7).

A user can dial any number that his or her station is not restricted from dialing. A station user can dial any numbers restricted by a restriction level that is equal to or lower than the one assigned to his or her station. A station that is restricted from dialing a certain telephone number on a certain line can, if programming permits, dial that number on another line that is not restricted.

As a user dials a number from a station that has toll restriction assigned, the toll restriction feature first makes a comparison between the dialed number and the telephone number entries on the toll restriction table. It compares the dialed number up to the last digit in the entry. At that point it considers it a match and applies the other restriction tests whether the station user keeps dialing or not.

Example entry A: 1-804 555-1212
Example entry B: 1-804
In example A, the toll restriction feature continues matching digits (and does not apply any restriction) until the the user dials the entire 11-digit number.
In example B, the feature applies restriction after the user dials 1-804.

If the feature finds a match in the toll restriction table, it next compares the dialed number to entries in the toll group. If it finds a match here, it next compares the restriction level of the entry against the restriction level of the station. If the restriction level of the station is equal to or less than the restriction level of the matched entry, the toll restriction feature allows dialing over the line specified with the toll group assignment. If the restriction level is greater than the restriction level of the matched entry, the toll restriction feature compares the dialed number to the exception number list. If it finds a match there, it allows the call.

11.1 Toll Restriction Example 1

In this example, the chief executive can dial all telephone numbers except those numbers with a restriction level of always deny. The section manager can dial all numbers except those in restriction level 8 (international numbers over lines assigned to toll group 1) and those numbers with a restriction level of always deny. The unit manager can dial all numbers except those numbers in restriction levels 7 and 8 (international numbers over lines assigned to toll group 1 and out of state numbers over lines assigned to toll groups 16 and 17) and those numbers with a restriction level of always deny. All other users can dial all numbers except those in restriction levels 6 (local calls over lines assigned to toll group 5), 7 (out of state numbers over lines assigned to toll groups 16 and 17), 8 (international numbers over lines assigned to toll group 1) and those numbers with a restriction level of always deny. All toll restricted stations can dial 1800 numbers on all lines. No toll restricted station can dial 1900 numbers on any line. Note that the feature allows dialing on lines that are not in the toll group. As illustrated in this example, there is no restriction for international dialing on lines in toll groups 2, 5, 16, and 17 and there is restriction only on lines 1–5 in toll group 1.

Toll Category	Dialing	Restriction Level	Toll Group
Chief Executive	International 011	8	1,
Section managers	Out of state	7	16, 17
Unit managers	In state	6	5
All other users	Local calls	1	2
911	Always allow	Allow all	32
1800	Always allow	Allow all	32
1900	Always deny	Allow all	32

Toll Group	Lines Assigned
1	1, 2, 3, 4, 5
2	6, 7
5	12, 13
16	14, 15
17	20, 25, 26, 27, 28, 29, 30
32	All Lines

DXP

Digital Communications System

General Description For Software Release 10A

This publication reflects software release 10A.

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1 Introducing Software Release 10A

Software release 10A for DXP contains a unique group of features that enhance system operation in a variety of ways. Software 10A does not replace software 9 as this earlier software release still provides a full compliment of existing features for those who do not want or need the unique features that are a part of the 10A release.

Software release 10A provides the following system enhancing features:

- Board Configuration (new logical to physical relationship and additional T1/E1 slots)
- Call Forward Outside System (CFOS)
- E1 Line Board Support (for international applications)
- Station Hunting
- Visual Man-Machine Interface (VMMI) programming

Understanding The Considerations For 10A Software

Understanding The 10A Hardware Considerations

- The DXP system must be operating on a DXCPU–68K CPU board. The 10A software release is not compatible with systems using a DXCPU–186 CPU board found in earlier produced DXP systems.
- The board configuration feature requires new cabinet labeling. (The 10A software package includes new labels.)
- The T1/E1 circuit board can occupy new locations in addition to those allowed in previous software releases.
- The 10A software release requires a new Random Access Memory (RAM) card (product code DXRAM–EXPC.) that you must install as part of the software up-grade.

Understanding The 10A Software Considerations

- The PCMMI (off-line) and embedded MMI (on-line) programming procedures are no longer available with 10A software; however, a new windows-based Visual Man-Machine Interface (VMMI) on-line programming technique, complete with exhaustive help files, is available to replace it.
- The DXP database **must** be at least revision 9A before you can up-grade it to 10A. (You can use the 9A revision of the PCMMI programming software to up-load your current DXP database and then down-load it to a data storage area such as your computer's hard drive as a revision 9A database.*). You must then use the new VMMI feature to translate this stored 9A database into a 10A database before you load it back into the DXP.
- The PC Attendant Position software must be at least revision 5A. (You **must** up-grade the software in your PC Attendant to this level to be compatible with the 10A software release.*) It is a good practice to up-grade the PC Attendant Position computer to contain at least 2 megabytes of RAM memory. While this may not be necessary for every installation, up-grading to 2 megabytes of RAM memory ensures that the PC Attendant Position functions properly under all conditions.

** Remember, you can always down load the latest PCMMI, VMMI, and PC Attendant software from the Comdial Technical Services Bulletin Board by calling 1–804–978–2583 or from the Comdial home page on the World Wide Web by connecting at: http://www.comdial.com/ .*

2 Explaining The Software Release 10A Features

Software release 10A provides the following system enhancing features:

- Board Configuration (new logical to physical relationship and additional T1/E1 slots)
- Call Forward Outside System (CFOS)
- E1 Line Board Support
- Station Hunting
- Visual Man-Machine Interface (VMMI) programming

Understanding The Board Configuration Feature

Defining The Physical And Logical Board Locations

Beginning at software release 10A, the DXP uses two distinctions for station and line locations: the physical location and the logical location.

The **physical location** corresponds to the order of the board slots in the system; these physical slot locations never change. There are 16 possible physical slot locations in the DXP (nine slots in the main cabinet and seven slots in the expansion cabinet) that permit the DXP system to provide a maximum of 128 lines or 192 station ports,

- The right-most four slots (slots 6 through 9) in the main cabinet are reserved exclusively for line boards.
- Slots 1 and 2 in the main cabinet are the only slots that accept auxiliary boards; however, these slots will also accept line or station boards.
- All universal slots in both the main and expansion cabinets will accept either line or station boards.
- Slots 3, 5, and 8 in the main cabinet and slots 12, 14, and 16 in the expansion cabinet are the specified slots for T1/E1 boards. While software release 10A still limits T1/E1 boards to specified locations, it permits you to use more of them and liberalizes the adjacent slot installation considerations that you must make:
  - There are fewer limitations for placing other line board types in universal slots adjacent to the T1/E1 board slots. By reducing the limitations on line board placement from earlier software requirements, the system makes room for the installation of additional station boards thus increasing the amount of stations a system can support when it has T1/E1 boards installed.
  - There are some limitations for board placement in universal slots 2, 4, 11, 13, and 16 when a T1/E1 board occupies slot 3, 5, 12, 14, and 16.

T1/E1 Fractional Capacity	Board Allowed In Adjacent Left Slot
8-Port T1/E1 Board	Station Board or Non-T1/E1 Line Board
16-Port T1/E1 Board	Station Board or Non-T1/E1 Line Board
24-Port T1/E1 Board	Non-T1/E1 Line Board
30-Port E1 Board	None

  - There are some limitations for non-T1/E1 line board placement in slots 6, 7, and 9 when a T1/E1 board occupies slot 8.

T1/E1 Fractional Capacity	Non-T1/E1 Line Board Allowed In Adjacent Left Slot		
	Slot 6	Slot 7	Slot 9
8-Port T1/E1 Board	Line Board Allowed	Line Board Allowed	Line Board Allowed
16-Port T1/E1 Board	Line Board Allowed	Line Board Allowed	Not Allowed
24-Port T1/E1 Board	Line Board Allowed	Not Allowed	Not Allowed
30-Port E1 Board	Not Allowed	Not Allowed	Not Allowed

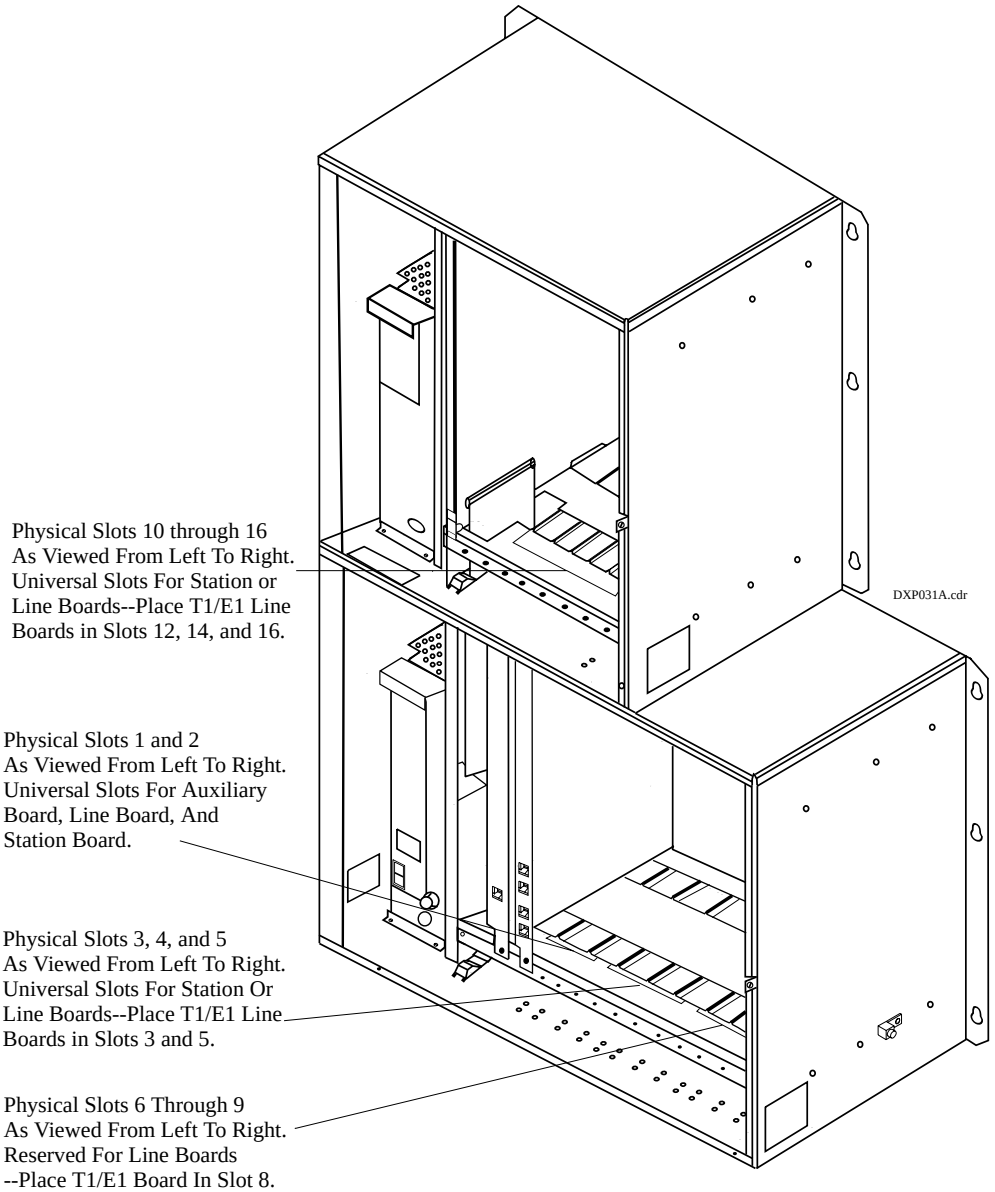
No matter what type of board you install in the first universal slot in the main cabinet, that slot is always physical slot 1. The physical slot numbers begin with the first universal slot in the main cabinet and number from left to right. The first universal slot in the expansion cabinet is physical slot number 10. Installers need to know the physical location of the boards in order to properly wire the lines and stations.

NOTE: The left to right order for the four exclusive line board slots (slots 6 through 9) in the main cabinet are reversed from the order that they occupied with software revisions prior to release 10A.

The **logical location** of a station or a line corresponds to its relationship to the other stations or lines in the system and is not dependent upon the board's location in the cabinet. Therefore, if you have installed your first station board into slot five of the main cabinet, for example, the system still refers to the first station on that board as logical station one (station one always defaults with intercom 101).

CAUTION

This logical location is a major departure from the way the system operated prior to software release 10A.


Physical Slots 10 through 16
As Viewed From Left To Right.
Universal Slots For Station or
Line Boards--Place T1/E1 Line
Boards in Slots 12, 14, and 16.
DXP031A.cdr
Physical Slots 1 and 2
As Viewed From Left To Right.
Universal Slots For Auxiliary
Board, Line Board, And
Station Board.
Physical Slots 3, 4, and 5
As Viewed From Left To Right.
Universal Slots For Station Or
Line Boards--Place T1/E1 Line
Boards in Slots 3 and 5.
Physical Slots 6 Through 9
As Viewed From Left To Right.
Reserved For Line Boards
--Place T1/E1 Board In Slot 8.

Locating The Physical Line Ports

Describing How Automatic Configuration Works

Beginning with software release 10A, there are no dedicated station or line ports in the DXP, the system uses an automatic configuration method to number the lines and stations. When you master clear the system, it automatically searches for all installed line and station boards in the main and expansion cabinet, identifies each board type and location, and automatically numbers the ports on every installed board (see the next section, *Understanding How The System Renumbers Logical Ports*, for more information on renumbering).

Understanding How The System Renumbers Logical Ports

The automatic renumbering configuration, which renumbers the **logical** ports, begins at the left-most universal slot in the main cabinet and proceeds left to right. When the system has configured all of the boards in the main cabinet, it moves to the expansion cabinet and continues searching from left to right until it has numbered all of the lines and stations. When the configuration is finished, the line and station ports are numbered logically from left to right in both cabinets. Remember, this automatically happens as a result of a master clear operation.

Adding Boards Without Renumbering

When you install additional boards or relocate existing boards after the system is in service, the logical numbers of the stations or lines on the added board continue from the last assigned logical number. For example, if your last assigned station number was 116, the next station number will be 117, regardless of the board's physical slot. This is not true, however, when you remove and delete a board through programming. After you remove and delete a board through programming, that board's logical ports are available for reassignment. So an added or relocated board would then take the logical port numbers from the removed board and not from the end of the logical sequence. For example, if your system had 64 stations served by four 16-station station boards and you were to remove a station board that had held logical stations 1–16, the next station board that you installed would occupy logical station ports 1–16 and not logical ports 65–80. If you were to remove an 8-port board and replace it with a 16-port board, the first eight ports on the new board would replace the original eight logical port numbers, and the remaining eight ports would begin with the last assigned logical port. So using this scenario, the new 16-port board would have logical ports 1–8 and logical ports 65–72.

Explaining Call Forward Outside System

The Call Forward Outside System (CFOS) feature allows the system to forward incoming or transferred line calls to telephone numbers that are outside the system. The CFOS feature forwards calls over any available outbound lines or line groups and does not use any conference circuits. Since CFOS involves outbound calls, those calls are subject to all line access, toll restriction, and automatic route selection restrictions normally imposed on the users. Any calls that CFOS can not service (no outbound line available, toll restricted, and so forth), ring the system as normal calls. Note also that CFOS will not forward calls associated with group intercoms and hunt groups. The CFOS feature is useful for after-hours forwarding of business calls to an alternate site such as a home or cellular telephone. To help system managers keep account of CFOS activity, the system marks CFOS calls with an *F* in the SMDA records.

Users activate or deactivate CFOS by dialing a feature code, pressing a preprogrammed button or pressing an interactive button on an LCD speakerphone. Once users activate CFOS, they select the outbound line or line group in any of the normal line selection methods available to them. They also designate the forward destination by dialing the number or pressing a speed dial button. (If users do not make a line and destination choice, the system uses the most recently used selections.) DISA callers can activate and deactivate CFOS remotely. When DISA callers activate CFOS, they receive several quick tone bursts and the system awaits any program changes. When they deactivate CFOS, the system returns dial tone. After they gain access to the system, they can dial the CFOS code, dial an outbound line or line group selection, and dial the destination number. Once a user activates CFOS, it remains active and neither system resets nor power outages will deactivate it. After activation, incoming or transferred calls to an idle CFOS-enabled station forward outside the system to the CFOS destination over the selected outbound line or line group. CFOS-forwarded calls are subject to the line-to-line disconnect timer action. If time-out occurs, the system alerts the system operator. He or she can join the call as a conference member.

Before CFOS can occur for calls on incoming lines, programmers must enable those lines for CFOS capability. Before a CFOS-enabled station can forward a call outside the system, the system must be able to associate the call receiving line with the station.

- Programmers can take action to associate a CFOS-enabled line with an individual CFOS-enabled station. With this arrangement, this station is the only one that can forward to an outside destination for a call received on that line.
- At sites served by DID line blocks, programmers must enable those lines for CFOS capability but they do not associate the individual lines with specific CFOS-enabled stations. The system uses the DID translated station extension to check for the station’s CFOS forwarding ability.
- When another station transfers a call to a CFOS-enabled station, the feature does not require a line association with the CFOS-enabled station for it to forward the transferred call outside the system. In this case, the system identifies the CFOS-enabled station before it makes the transfer.
- In addition to the line programming action discussed previously, programmers enable CFOS system-wide with a system programming choice. They then enable the feature in both station class of service and individual station programming, and may map a CFOS button on the applicable telephones. When mapping the button, programmers can also select a destination number; however, any user selected destination number overrides this selection.

In summary, to fully enable CFOS for use, programmers must take the following programming actions:

– enable CFOS with system programming,
– enable CFOS in station class of service,
– assign the CFOS class of service to the CFOS stations,
– enable CFOS in individual station programming,
– map a CFOS button on non-LCD telephones,
– select a destination number while mapping the CFOS button,
(this is an optional step—any user selection overrides this selection),
– enable lines for CFOS capability,
– associate a CFOS-enabled line with an individual CFOS-enabled station,
– enable DID line blocks (when used) for CFOS capability.

CAUTION

Comdial has taken reasonable steps in the design of all product features, including CFOS, which protect against unauthorized or fraudulent access to, or use of, a system, or which protect against unauthorized, fraudulent or unaccounted-for access to, or use of, long distance lines. However, no system is entirely invulnerable or immune from unauthorized or fraudulent access or use, or unaccounted-for access or use, and therefore Comdial disclaims any and all liability, and makes no warranty, express or implied, relating to unauthorized or fraudulent access or use, or unaccounted-for access or use.

NOTES:(1) CFOS will not work on loop start lines without disconnect supervision.
(2) Calls forwarded through CFOS may experience lower audio levels due to the normal line resistance of CO lines. Low audio level is usually only noticeable on long line loops. If signal loss is a problem at a particular site, the installer may need to add a line amplifier (repeater) in the lines.

Supporting the E1 Line Board

Beginning with software release 10A, the DXP supports the use of the DXPE1–nnn line board for international applications. The E1 board provides 30 channels of voice transmissions over a single, four-wire, 120 ohm cable or over two 75 ohm coaxial cables using multiplexing techniques. The DXP accepts up to six DXPE1–nnn line boards in specified board slot locations—three in the main cabinet and three in the expansion cabinet.

Different nations require different system parameters to enable E1 activation and operation; therefore, Comdial supports each international application with a unique publication that provides complete technical details for the E1 feature when used in a particular nation.

Understanding Station Hunting

Station hunting is available to systems with a software revision of 10A and later. Station hunting provides a means of routing both intercom and outside calls through an installer-determined grouping of stations. This call routing continues to a designated overflow location in case of no answer or if all stations in the hunt group are busy. Station hunting works equally well with intercom, standard central office (CO) lines, direct inward dialing (DID/DNIS) lines, direct inward system access (DISA) lines, and E&M tie lines.

For station hunting purposes, stations are considered busy under the following conditions:

- when they are currently connected with a call (internal or external),
- when they have an incoming call currently ringing,
- when they have a call on hold, in DND, call forwarded, out of service, or being intercepted by an OAI application.

The installer can enable default call forwarding for a hunt group station. This feature allows the system to forward the non-hunt group routed calls that a station receives. Calls routed to a station by the station hunting feature ignore the default call forwarding settings. The installer can assign all types and any number of lines to ring at a hunt group. He or she can assign the lines as direct, delayed, day 1, day 2, or night ringing lines.

To configure station hunting, you program the following parameters:
Options: Programs the attributes, hunting type, and timers for the hunt group.
Member List: Programs the list of stations within a hunt group. This parameter shows the member stations in their assigned hunting order and allows stations to be added, deleted or inserted at any point in the list.
Delete: Deletes the selected hunt group from the system and frees its used resources.

CAUTION

Before you edit a member list for a hunt group, you must set the group's hunt type to NONE; however, before you view a hunt group's member list, you must select a hunt type other than NONE.
Further, before you delete a hunt group, be sure that there are no un-answered calls ringing in the group (that is, the hunt group must be idle). If the settings are not correct for either of these editing operations, the system will not allow the operation to take place and will display messages as to the reason.

Hunt Group Attributes

Pilot Extension: This is the extension number that callers dial to call or route calls to this hunt group. The pilot extension number is similar to a personal intercom number, or extension number, and follows the same numbering plan restrictions. When station hunting is used with DID/DNIS, the pilot extension is the extension number assigned in the DID/DNIS translation table. When station hunting is used with DISA, the pilot extension can be the extension number assigned to the single digit translation for the digital voice announce (DVA) message associated with the DISA line.

Name: The hunt group's name is the seven character alphanumeric name of this group that is used for LCD display and reference.

Full Name: The hunt group's full name is the 20 alphanumeric character name of the group that is used by OAI applications. (Future development will support OAI access and control of station hunting.)

Direct Ring Lines: The list of lines that directly ring at this hunt group when the system is not in the night mode of operation. This list can contain any lines in the system.

Delayed Ring Lines: The list of lines that delay ring on this hunt group. This list can contain any lines in the system.

Day 1, Day 2, Night Ring Lines: The lists of lines that can ring this hunt group during these programmed times. These lists can contain any lines in the system.

Member Stations: The list of stations that are members of this hunt group. This list can contain all stations in the system but is limited to personal intercom numbers only.

Overflow Destination: The overflow destination is a station intercom number, a group intercom number, a voice mail number, or another hunt group pilot extension where the system routes unserviced hunt group calls.

Queue Ringing Calls: With the queue ringing calls feature disabled and if all stations in the hunt group are busy, the system immediately routes hunt group calls to the overflow destination. With the queue ringing calls enabled, in the case of no answer or if all stations in the hunt group are busy, hunt group calls wait in a queue to be answered until an overflow timer times out then route to the overflow destination.

DID/DNIS Display for Station Hunt Groups: Beginning with software release 10A, if station hunt group members need to differentiate incoming DID/DNIS calls, programmers can take action to cause a different display to occur. With this feature active, the display shows the incoming digits or translated name instead of the station hunting name.

Multiple Call Handling For Station Hunt Groups: Beginning with software release 10A, programmers can arrange the system to allow member stations within station hunt groups to handle multiple calls. With this feature turned off, the system considers any hunt group member stations that have calls on hold or in a park orbit to be busy to the station hunting call delivery process even though these stations are otherwise idle. With this feature turned on, the system considers any hunt group member stations that have calls on hold or in a park orbit to be available for additional call deliveries as long as these stations have ring positions available (that is: an available personal intercom number, hunt list and so forth).

Types Of Hunting

Terminal Hunting: Terminal station hunting always delivers a call to the first idle station programmed in the hunt group. If the station does not answer within a programmed amount of time (programmed as the Call Advance Timer), the system delivers the call to the next sequential idle station programmed in the hunt group. The system makes no attempt to balance the distribution of incoming calls as this is a linear search through the programmed list. The search starts at the beginning of the list for each incoming call.

Distributed Hunting: Distributed station hunting delivers a call to the next idle station in the hunt group after the station that received the previous call. If that station does not answer within the programmed call advance time, the system delivers the call to the next sequential idle station programmed in the hunt group. This hunting method is a linear search through the programmed list; however, the search starts wherever it left off after the previous call.

Longest Idle Station Hunting: Longest idle station hunting delivers a call to the station that has been idle for the longest period of time since completing the last call that was routed to it by the station hunting feature. In the case of stations with equal idle times (such as at system startup), the system picks the first of the grouped stations with equal idle times. If that station does not answer within the call advance time, the system delivers the call to the station with the next longest idle period.

Ring All Station Hunting: Ring all station hunting is not a true hunting method. This method delivers a call to all idle stations simultaneously. This is a good method to use when the site requires that all calls be answered as quickly as possible.

None (No Hunting): This selection disables hunting for the group. It allows a hunt group to be completely programmed yet disabled. Any intercom calls to this group will receive busy and line ringing ignores any programming within this group.

Station Hunting Timers

Call Advance Timer: This is the time interval that a station within a hunt group rings unanswered before the system routes the call to the next station in the group. This timer is programmable from 10 seconds though 5 minutes.

Overflow Timer: This is the maximum time interval that an unanswered call hunts within a group before the system routes it to the designated overflow station for the group. This timer is programmable from 30 seconds through 15 minutes.

Recall Timer: This is the maximum time interval that an unanswered transferred call hunts within a group before recalling to the source of the transfer. This timer is programmable from 30 seconds through 15 minutes.

Station Hunting Operation

When a system station user makes an intercom call to the hunt group pilot extension, the system rings the first available station within the hunt group (based on the group's selected hunting method). This ringing appears on the station's personal intercom. The system ignores all call announce settings as all intercom calls into a hunt group are treated as voice announce block calls. If the station does not answer the call within the programmed call advance time limit, the system rings the next station of the group. If no station answers within the programmed overflow time, the call rings the designated overflow destination.

When a line rings at a hunt group, it rings at the first available station within the group (based on the group's selected hunting method). As the ringing line appears at the station, it follows the DXP conventions for line appearances. If the station does not answer the call within the programmed call advance time limit, the system rings the next member station. If no station answers within the programmed overflow time, the system sends the call to the designated overflow destination.

The DXP supports a maximum of 32 hunt groups. Each hunt group can include the maximum number of stations that the system can support; however, due to system memory limitations, all hunt groups can not contain all stations simultaneously. Since the system makes a total of 16 Kbytes of memory available for station hunt groups, you can use the following formula to determine possible station hunt group capacities.

[16384 bytes] – [(Stations per group) x (2) + (220 bytes of memory)] = memory remaining for next hunt group

Detailing Toll/ARS 10A Software Considerations

Before you edit the toll/ARS restriction tables, you must disable the ARS system option; however, before you view the toll/ARS restriction tables, you must enable the ARS system option.

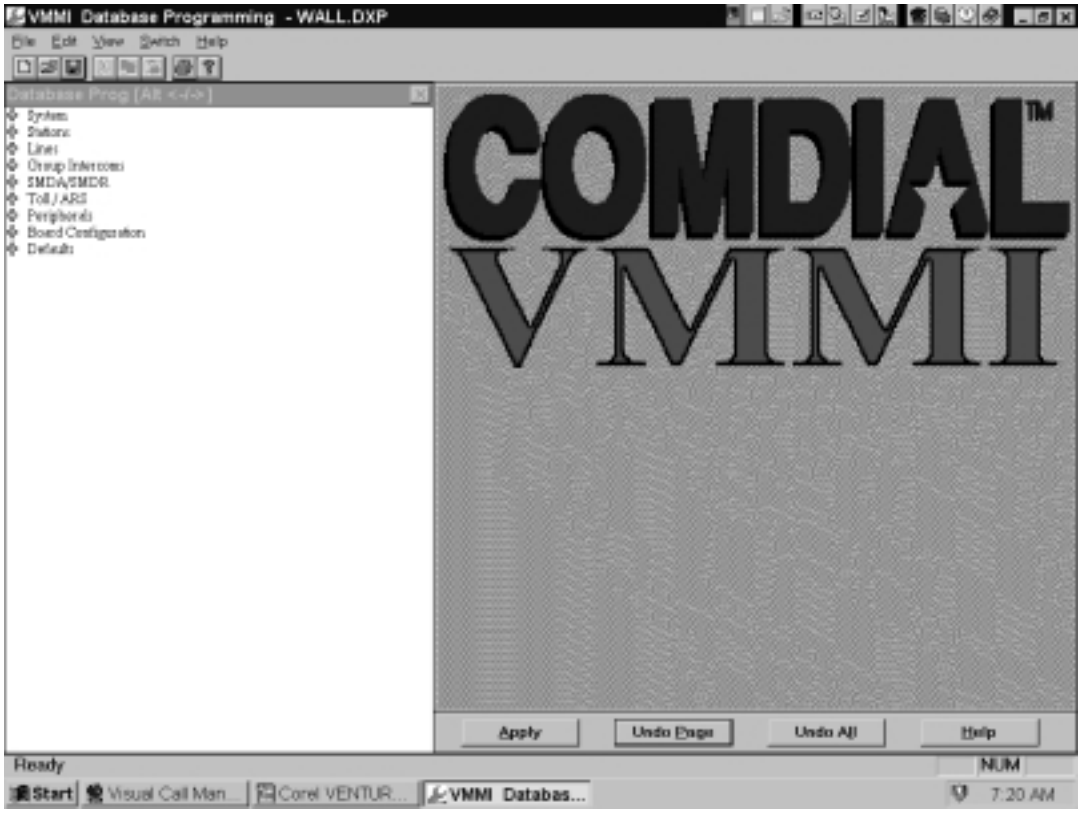
If you do not observe these setting requirements for either of these editing operations, the system will not allow the operation to take place and will display messages as to the reason.

Introducing the Visual Man-Machine Interface

The Visual Man-Machine Interface (VMMI) is menu-driven programming software for the DXP digital communications system. The VMMI software allows the programmer to enter choices in dialog boxes and accept the entries as valid. The VMMI program includes a detailed, context-sensitive, on-line help file that the programmer can reference at any time during the programming sequence. The software is accompanied by GCA40–182, *Understanding The VMMI*, which details start-up and operation. VMMI runs on an IBM*-compatible personal computer (PC) with a Microsoft Windows** operating system and at least 4 Mbytes of memory capacity. The PC communicates with the DXP through the serial data interface. The serial data connection can be either direct or remote through a modem hookup.

** IBM is registered trademark of International Business Machines Corp.*

*** Microsoft and Windows are trademarks of Microsoft Corp.*



Viewing A Typical VMMI Banner Screen

3 Up-Grading Your System To Software Release 10A

Up-grading to software release 10A requires that you perform the following detailed operations in the sequence that they appear in the following pages of this publication. If you need detailed procedures for doing these operations, refer to your DXP *System Hardware Instructions* and *Programming Instructions and Records* service binders and to GCA40–182, *Understanding The VMMI*.

Converting The Database

Storing The Current DXP Database

Employ a personal computer with an XMODEM communications program and use the current embedded MMI programming method to store the current DXP database to the computer's hard drive. The saved database can include any or all of the following data: system information, station parameters, line parameters, toll restriction and automatic route selection parameters, and system speed dial numbers but it does not include the SMDA/SMDR records. If you need these SMDA/SMDR records, you must make a printout of them before you perform the database storage. This is necessary because this save/restore feature does not record the stored records and they will be lost.

Once you store the current database disconnect your computer from the DXP.

Converting The Current DXP Database

With your computer disconnected from the DXP, convert the current database to a 10A database.

1. Obtain a copy of revision 9A or later PCMMI programming software and load it on your computer. (Remember, you can always down load the latest PCMMI software from the Comdial Technical Services Bulletin Board by calling 1–804–978–2583 or from the Comdial home page on the World Wide Web by connecting at: http://www.comdial.com/).
2. If the stored database is not at software release 9A, use the revision 9A or later PCMMI to convert the current DXP database to a software release 9A database.
3. Use the revision 9A PCMMI to down-load and store the software release 9A database to your computer's hard drive.
4. Load the new VMMI programming software on your computer, and use it to translate the stored data base to a 10A database.

Installing The RAM Card And Software Card

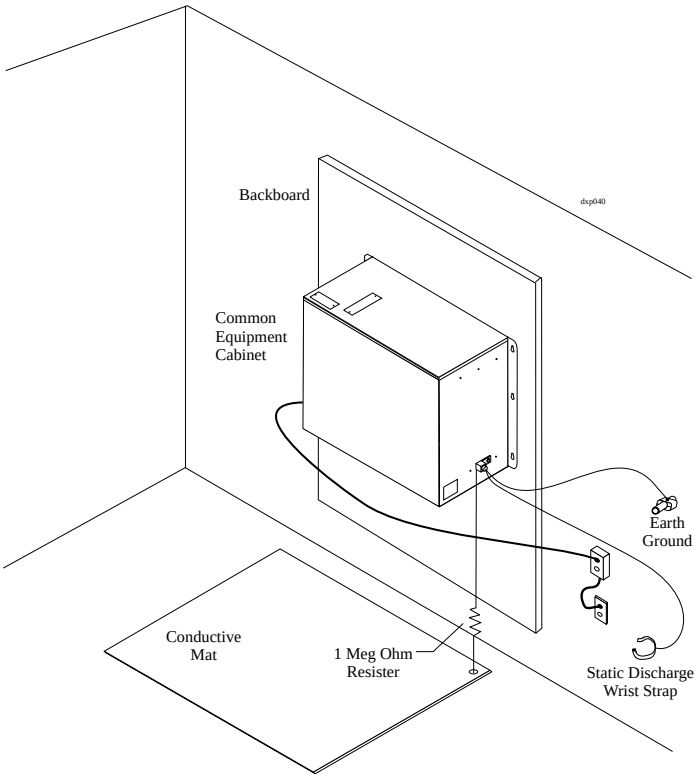
Turn off the power to the DXP, and install both the RAM card (DXRAM–EXPC.) and the software memory card (DXPSW–DLRC) on the central processor unit (DXCPU–68K) circuit board of the DXP digital communications system.

Preparing A Static-Safe Work Area.

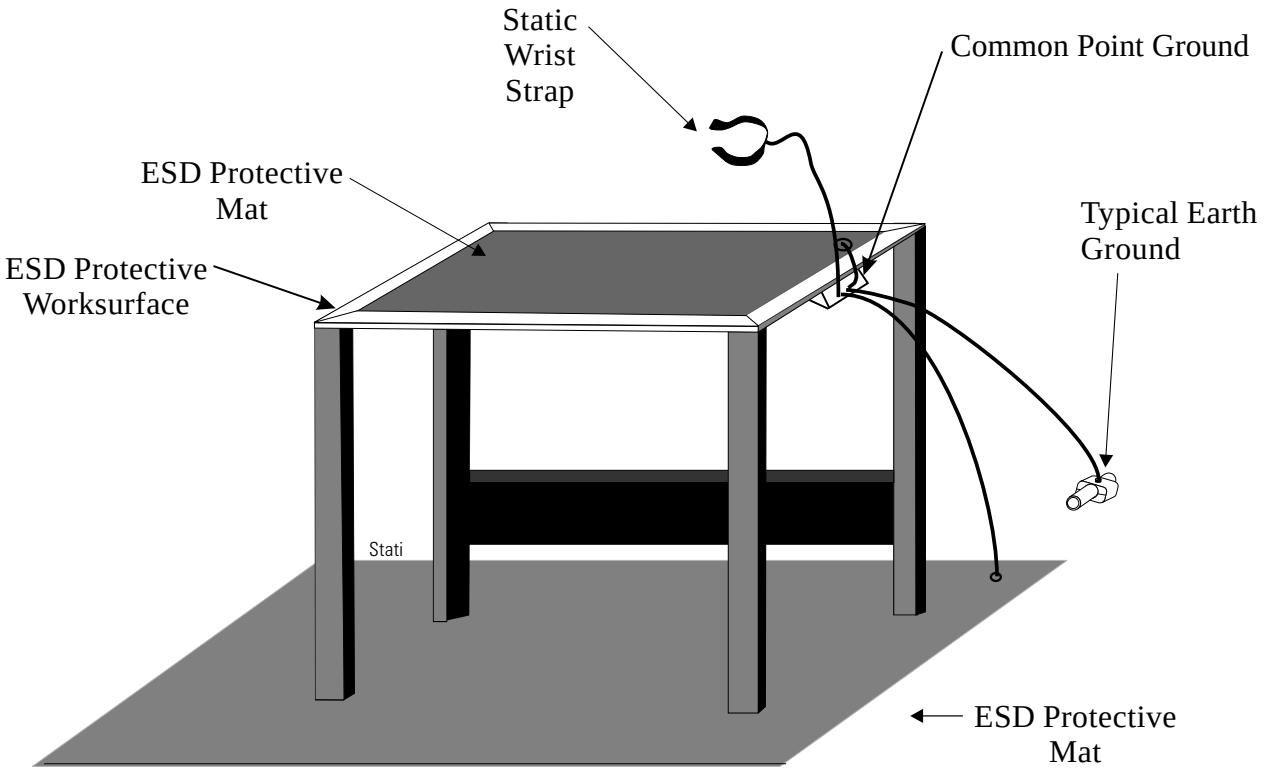
CAUTION

Electronic circuit boards are susceptible to damage caused by electrostatic discharge and must be handled accordingly. Refer to the Comdial publication IMI01–005, Handling Of Electrostatically Sensitive Components**,** *for general information. Specific handling precautions are also included in this installation instruction. The expanded memory card (DXRAM–EXPC) and the system software memory card (DXPSW–DLRC) are supplied in static protection bags. Do not open a static protection bag prior to installation time.*

When servicing electronic circuit boards, it is a good practice to do so at a static-safe work area prepared ahead of time for this purpose. The illustration details a typical static-safe work area.



Providing Static Protection At The Cabinet Location



Creating A Static Safe Work Area

Installing The Cards

1. Loosen the retaining hardware and remove the front panel from the DXP main cabinet.
2. Turn off the AC power switch, and disconnect the AC power cord from the AC outlet. Disconnect the cable of the optional battery back-up from the main cabinet power supply.
3. Place a conductive mat in front of the cabinet area and ground the mat to a good earth ground (the third wire ground of the AC power line is an acceptable grounding point). The grounded conductive mat will provide a safe static electric discharge path.
4. Install the static discharge wrist strap (supplied with the main cabinet) on your bare wrist; adjust it for a snug fit. Be sure that the strap is touching bare skin and is not isolated by clothing. Connect the wrist strap cord between the wrist strap and an AC or earth ground.

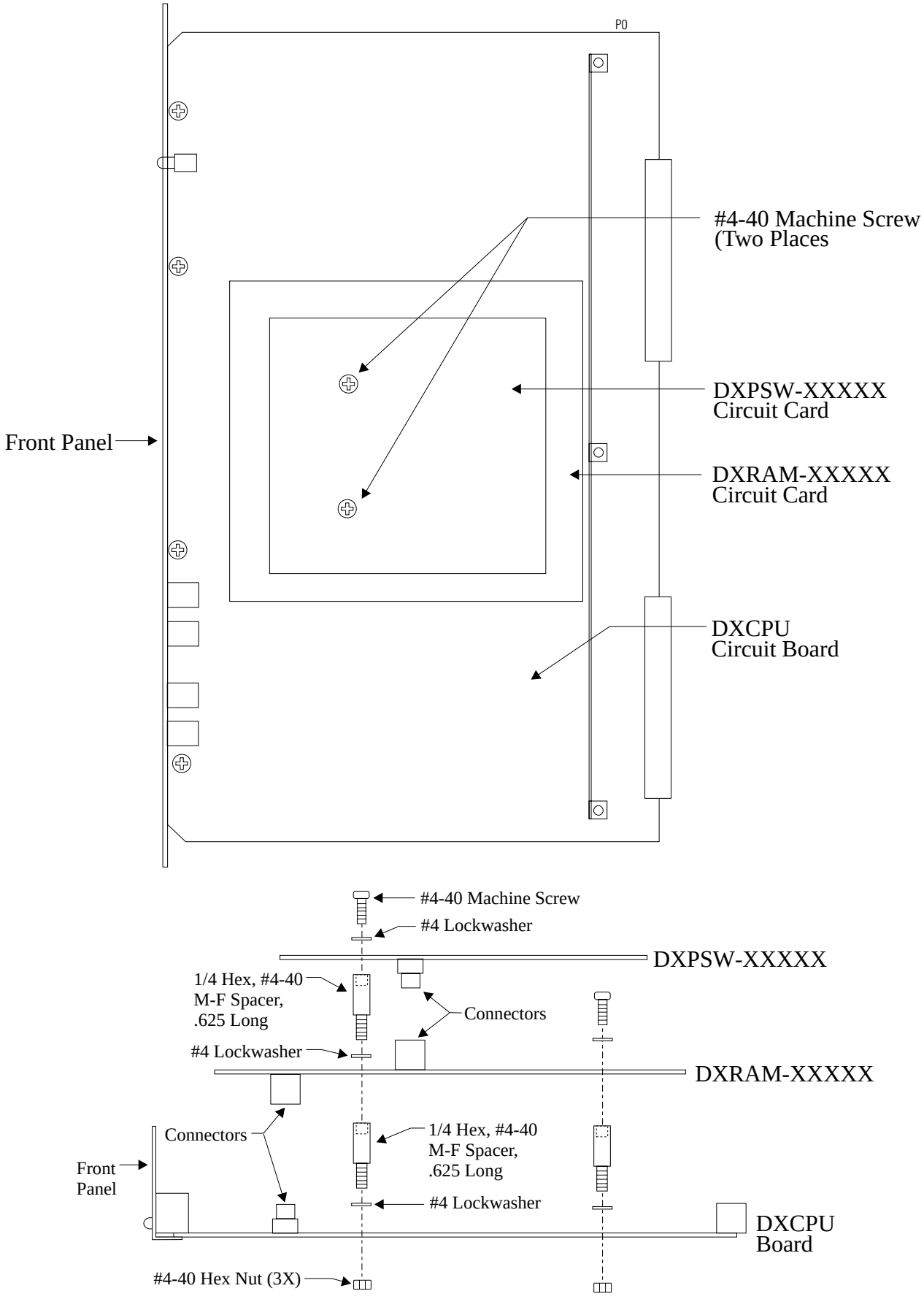
NOTE: With the common equipment in the installed position, the ground lug on the side of the cabinet is an appropriate grounding point since it should have a heavy ground wire connected between it and a good earth ground.

5. Locate the DXCPU–68K circuit board, loosen the retaining screws, remove it from the DXP main cabinet, place it in a static protection bag, and transport it to the static-safe work area.
6. At the static-safe work area, with your wrist strap in place, remove the DXCPU–68K circuit board, the new DXRAM–EXPC. expansion memory card and the new DXPSW–DLRC software memory card from their static protection bags.
7. Refer to illustration and remove the currently installed memory cards from the DXCPU–68K board.
8. Orient the DXCPU–68K board and the new memory cards as shown in the illustration, and attach them with the supplied hardware. (The screws and standoffs between the cards are essential to ensure proper grounding.)
9. Place the old memory cards in static protection bags and save them for later return for credit. Place the DXCPU–68K board and newly installed memory cards into a static protection bag and transport back to the DXP main cabinet.
10. With your wrist strap properly grounded, remove the DXCPU–68K circuit board from the static protection bag. Orient it with the top and bottom guides in the main cabinet board cage, and press it in firmly until the board edge connector properly mates with the backplane connector.

CAUTION

When pressing the DXCPU–68K board into place, press it only at the extractor lever locations. If you apply pressure at other locations, you may damage the board assembly.

11. Make a final inspection to ensure that the DXCPU–68K circuit board is in the correct slot, oriented correctly and mated properly; then install and tighten the supplied screws to secure it to the board cage.



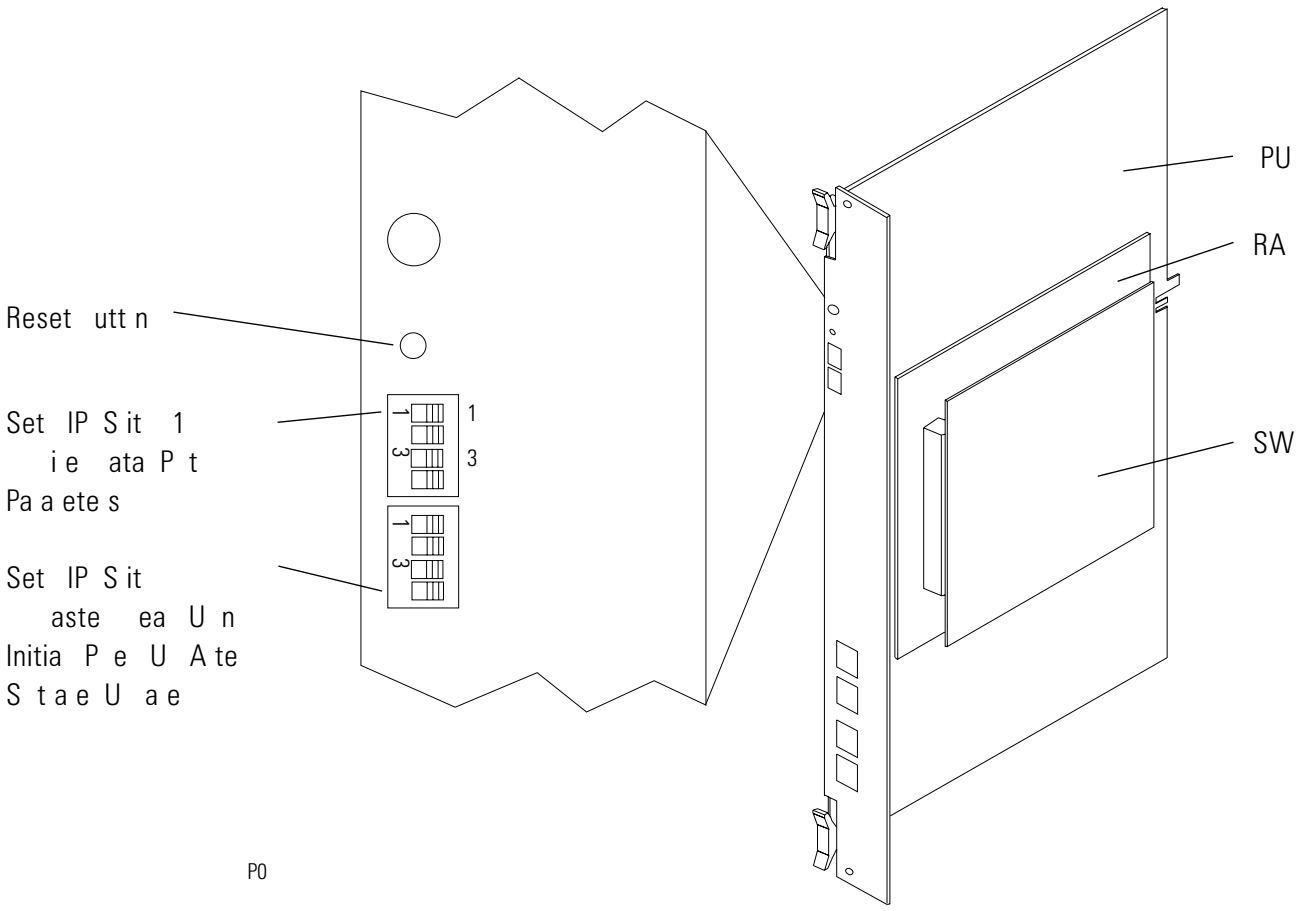
Installing The Memory and Software Cards

Master Clearing The System

1. If you do not master clear the system, it is possible the DXP will not perform properly with the new memory card. The DXCPU–68K board provides a method for the master clear to occur automatically at the initial power up after you have changed or upgraded the software card. When you perform an upgrade, you must execute the following sequence of events exactly as they are stated here:
2. On the DXPCPU–68K circuit board, set DIP switch 8 to its ON position. This step enables the DXP to perform the master clear and is a required step; otherwise, the software upgrade will not occur and the system will not operate.
3. Connect the AC power cord to the AC outlet and turn on the AC power switch. At power up, the DXP automatically executes a master clear operation. Observe that the LED indicators on the DXCPU–68K board, the DXSRV services board, and all installed station and line boards flash in a random pattern during the master clear sequence. After the master clear sequence is complete, the indicators on the DXCPU–68K and DXSRV boards turn on steady and the indicators on the station and line boards wink ON for four seconds and OFF for four seconds.
3. After power up, set DIP switch 8 to its OFF position.
4. Press the RESET button on the CPU board to reset the system.

NOTE: The system performs the automatic master clear one time following the initial power up after you have up-graded the software. It will not perform an automatic master clear operation again after subsequent power ups. Because of this, you can leave DIP switch 8 ON if you wish. Leaving it ON will ensure that the DXP will always power up in a master cleared and operational mode after you have performed a software upgrade. However, by turning DIP switch 8 OFF, you prevent the DXP from becoming operational at power up after you have performed a software upgrade. This is good because, should you forget to save your database, it gives you an opportunity to reconsider your actions before the DXP erases the current database.

5. Replace the front panel on the DXP main cabinet.



Locating DIP Switch 8 and the Reset Button

Up-Loading The Converted Database To The DXP

Connect your computer to the DXP and use VMMI to up-load the translated 10A database to the DXP. (Note that with VMMI, you do not need the XMODEM communications program that you needed to store the current database)

DXP

Digital Communications System

General Description For Software Release 11A

This publication reflects software release 11A.

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1 Introducing Software Release 11A

Software release 11A contains new features and feature enhancements designed to make the DXP system easier for end users to use. The software changes and additions are as follows:

- A-Law DXP Tones,
- ANI / DNIS Enhancements,
- ARS Access per Trunk Group,
- ARS Delayed Dialtone,
- End to End Signaling on Intercom,
- Inhibit Message Wait Stutter Dialtone,
- ISDN–PRI Interface,
- SMDA Metering Pulse Totals,
- SMDA Report On Answer,
- Impression Telephone Support.

11A Hardware Considerations

If you are upgrading to 11A from software 10A, you **do not** need to make any hardware changes to the DXP system. However, if you are upgrading to 11A from software 9A, you must make sure that the DXP system meets the following prerequisites:

- The DXP system must be operating on a DXCPU–68K CPU board. The 11A software release is not compatible with systems using a DXCPU–186 CPU board found in earlier DXP systems.
- The board configuration feature requires new cabinet labeling. (The 11A software package includes new labels.)
- The T1/E1 circuit board can occupy new locations in addition to those allowed in previous software releases.
- The 11A software release requires a new Random Access Memory (RAM) card (included with the DXPSW–DLRP software package) that you must install as part of the software up-grade.

11A Software Considerations

- The PCMMI (off-line) and embedded MMI (on-line) programming procedures are no longer available with 11A software. A windows-based, Visual Man-Machine Interface (VMMI) on-line programming system with help files now replaces the MMI.
- The DXP database must be at least revision 9A before you can up-grade to 11A. You can use the 9A revision of the PCMMI programming software to up-load your current DXP database and then down-load it to a data storage area—such as your computer's hard drive—as a revision 9A database.* You must then use the the new VMMI feature to translate this stored 9A database into a 11A database before you load it back into the DXP.
- The PC Attendant Position software must be at least revision 5A. (You must up-grade the software in your PC Attendant to this level to be compatible with the 11A software release.*) It is a good practice to up-grade the PC Attendant Position computer to contain at least 2 megabytes of RAM memory. While this may not be necessary for every installation, up-grading to 2 megabytes of RAM memory ensures that the PC Attendant Position functions properly under all conditions.

**Remember, you can download the latest PCMMI, VMMI, and PC Attendant software from the Comdial Technical Services Bulletin Board by calling 1-804-978-2583 or from the Comdial home page on the World Wide Web at: http://www.comdial.com/.*

2 Explaining Software Release 11A Features

Software release 11A contains the following new features and feature enhancements:

- A-Law DXP Tones,
- ANI / DNIS Enhancements,
- ARS Access per Trunk Group,
- ARS Delayed Dialtone,
- End to End Signaling on Intercom,
- Inhibit Message Wait Stutter Dialtone,
- ISDN–PRI Interface,
- SMDA Metering Pulse Totals,
- SMDA Report On Answer,
- Impression Telephone Support.

A-Law DXP Tones

Software 11A supports the tone plan for the A-Law DXP available for South Africa.

ANI / DNIS Enhancements

Software 11A enhances the DNIS feature by adding an option to support the DTMF ANI / DNIS with two information digits. When programmers enable this feature option, the format of the digit string changes from the ✳**ANI**✳**DNIS**✳ format to a format that includes a two-digit code that indicates the presence of ANI digits (**I ANI DNIS** where **I** equals the two-digit string). The ANI digit string indicates the calling party's telephone number. The DNIS digit string identifies the call destination station.

ARS Access Per Trunk Group

DXP software 11A allows the access code for any line group in the system to provide access to ARS. By default, the line group 1 access code will provide ARS access when ARS is enabled. You can program this item on a line group parameter.

ARS Delayed Dialtone

Software 11A adds a delay option for ARS Dialtone. When "Dial Tone 4" is selected, there is a 1 second delay before dialtone is presented to the caller. The dialtone frequency is the same as the system intercom dialtone, but the delay gives the impression a "fresh" dialtone for outbound dialing.

End To End Signaling On Intercom

On previous DXP software versions, DTMF tones were not broadcast on station-to-station calls. Software 11A adds the End-to-End Signaling feature, allowing stations to send and receive DTMF digits through the intercom path. Use station parameter programming to set the extension to receive DTMF digits. End-to-End signaling can be enabled on any station port and is useful when connecting voice mail systems or door boxes.

Inhibit Message Wait Stutter Dialtone

Software 11A allows you to enable or disable the stutter intercom dialtone received at a station to indicate a message waiting. You can program this item as a station COS parameter.

ISDN–PRI Interface

Integrated Services Digital Network (ISDN) provides integrated voice and data over a common telephone company facility. There are two methods of ISDN access currently available: ISDN–BRI (basic) and ISDN–PRI (primary). ISDN–BRI provides a way for subscribers to get digital service from the telephone company supplier for two telephones or a telephone and a data device over one special pair of wires. ISDN–PRI provides a way for subscribers to get digital service from the telephone company supplier for 24 lines over two special pairs of wires. This latter method is the concern of this publication.

ISDN–PRI access directly connects a multiple-station, digital communications system to the telephone company's ISDN network through a single high-speed line. This high-speed line is commonly known as T1 in North America and consists of 24 digitized channels. ISDN–PRI access consists of a grouping of 23 voice channels (B–channels) and one signaling or control channel (D–channel). B–channels are clear channels suitable for voice or data transmission while the D–channel is a packet-switched link for call set-up and signaling. When you use ISDN–PRI access with T1, one of the T1 channels serves as the signaling channel. This arrangement is sometimes referred to as 23B+D ISDN service.

The DXPRI is a circuit card that you install on a revision B or later DXPT1 line board with special-purpose firmware to provide ISDN–PRI access to the digital communications system. The DXPRI card handles the D–channel signaling protocol and passes messages to the DXPT1 board. A single DXPRI card can control multiple DXPT1 boards when you tie the boards together through board programming action. This arrangement (known as NFAS or Network Facility Associated Signaling) allows the system to derive 24 B–channels from all boards except the one where installers have added the the DXPRI card. When installers do this, the DXPT1/DXPRI combination that provides the control is designated as DXPT1–PRI; and the boards being controlled are designated as DXPT1–NFAS. The NFAS boards do not require a DXPRI card as they are slaves to the master –PRI board. Throughout the remainder of this publication, the term T1/PRI means a T1 board specifically configured for ISDN–PRI operation be it either a DXPT1–PRI or a DXPT1–NFAS board.

Since central office protocols differ, the DXPRI card supports several protocol arrangements and provides interface support for several signaling types. The programmer and the end user can select the interface support that the system needs for a particular application. The support they choose determines how the telephone company treats the signal.

The DXPRI card provides a calling number identification feature that provides the following services: delivery of network provided calling numbers, calling line identification presentation (CLIP), or automatic number identification (ANI). On originated calls, the system automatically provides the calling number if available; otherwise, it provides the default directory number. For incoming calls, the called station displays the calling number if available; otherwise, the display shows information determined by station class of service programming. The system programmer can customize the caller ID parameters for outgoing calls as site requirements dictate.

Introducing The T1/PRI Line Board

The revision B or later DXPT1 board with special-purpose firmware serves as host for the DXPRI card and gives gives the digital communications system the capability to handle up to 24 channels of voice and/or data transmissions over a single four-wire cable using multiplexing techniques. The DXPT1 board includes a customer service unit (CSU) to eliminate the need for an external CSU.

Defining T1/PRI Operation

T1/PRI is the digital two-way transmission of telecommunications over a single high-speed circuit. Up to 24 separate voice or data transmissions form digital pulses that are transferred at the rate of 1.544 million bits per second (Mbps) over the T1/PRI trunk. At the receiving end, the digital pulses are decoded into 24 separate circuits.

Pulse characteristics such as repetition rate, pulse width, pulse amplitude, and average ones density ((ratio of one (1) bits to zero (0) bits)) are as specified by digital signal level 1 (DS-1) described in American National Standards Institute Specification, ANSI T1.403-1989.

Detailing Where You Can Install T1/PRI Boards and Its Supporting Needs

Since the DXP *Plus* supports a maximum of 240 lines, and each T1/PRI board handles up to 24 channels, you can install up to 10 boards in the DXP *Plus* system. You can install these 10 boards in any available universal board slot in the main or expansion cabinets. Of course, any other line boards that you install, such as loop start, DID or multipurpose, reduce the number of lines available for T1/PRI service and thus reduces the number of T1/PRI boards you can install.

Whenever you install one or more boards, and the DXP *Plus* is receiving its timing signals from an external source (the usual case), you must install one synchronization card (DXOPT–SYN) on the services board. This means when you connect the system to central office (CO) lines, you must include a synchronization card, and the DXP *Plus* clock must be controlled by CO signaling.

CAUTION

For operation with the DXP Plus, the T1/PRI board must be Revision B or higher and have special-purpose firmware installed.

SMDA Metering Pulse Totals

DXP software 11A enhances the SMDA Metering Pulse Totals by adding a third option to the Report Option field. You can now select the option “Meter Pulses” as an alternative to “Call Cost” or “Hold Time” on all reports.

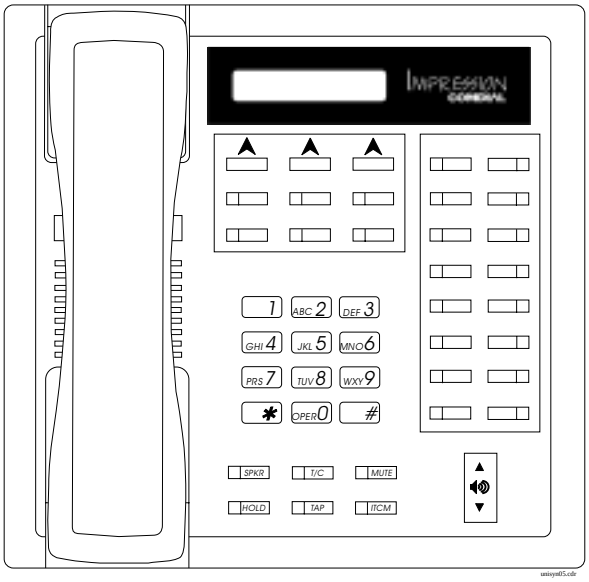
Metering Pulse is a method used in countries other than the United States to determine call duration and cost. Therefore, if you are installing the DXP system in a country that uses E1 lines, selecting this option will allow the DXP to cost calls by monitoring the metering pulses originating from the central office.

SMDA Report On Answer

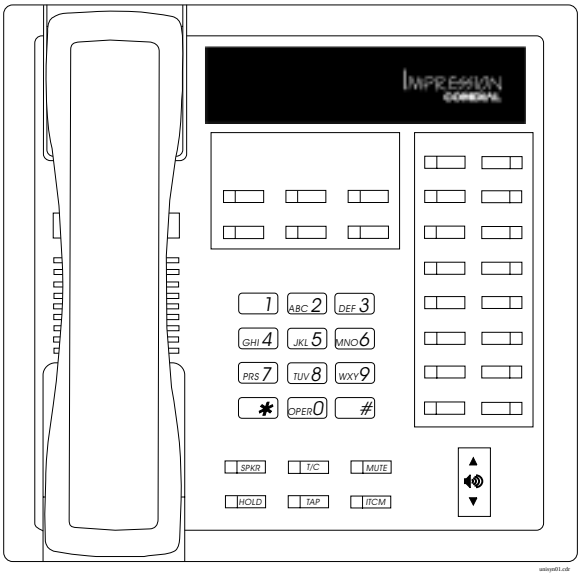
The SMDA Report On Answer feature enhancement for DXP 11A adds the option to create a report entry only for answered outbound calls. When this feature is enabled, outbound calls initiated on lines which provide answer supervision will not generate a report unless the call is answered. Call cost and time are based on call duration after answer.

Impression Telephone Support

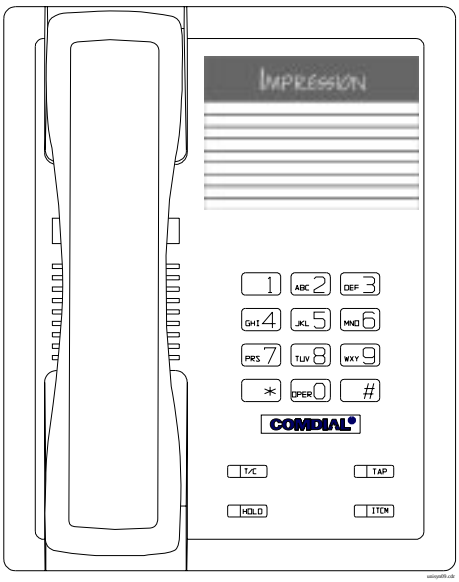
DXP software 11A supports Comdial Impression telephones.



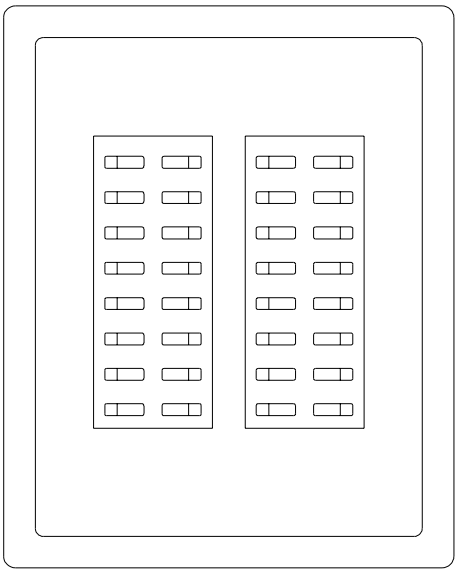
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2122S (22-Line Speakerphone)
2122X (22-Line Monitor Telephone)



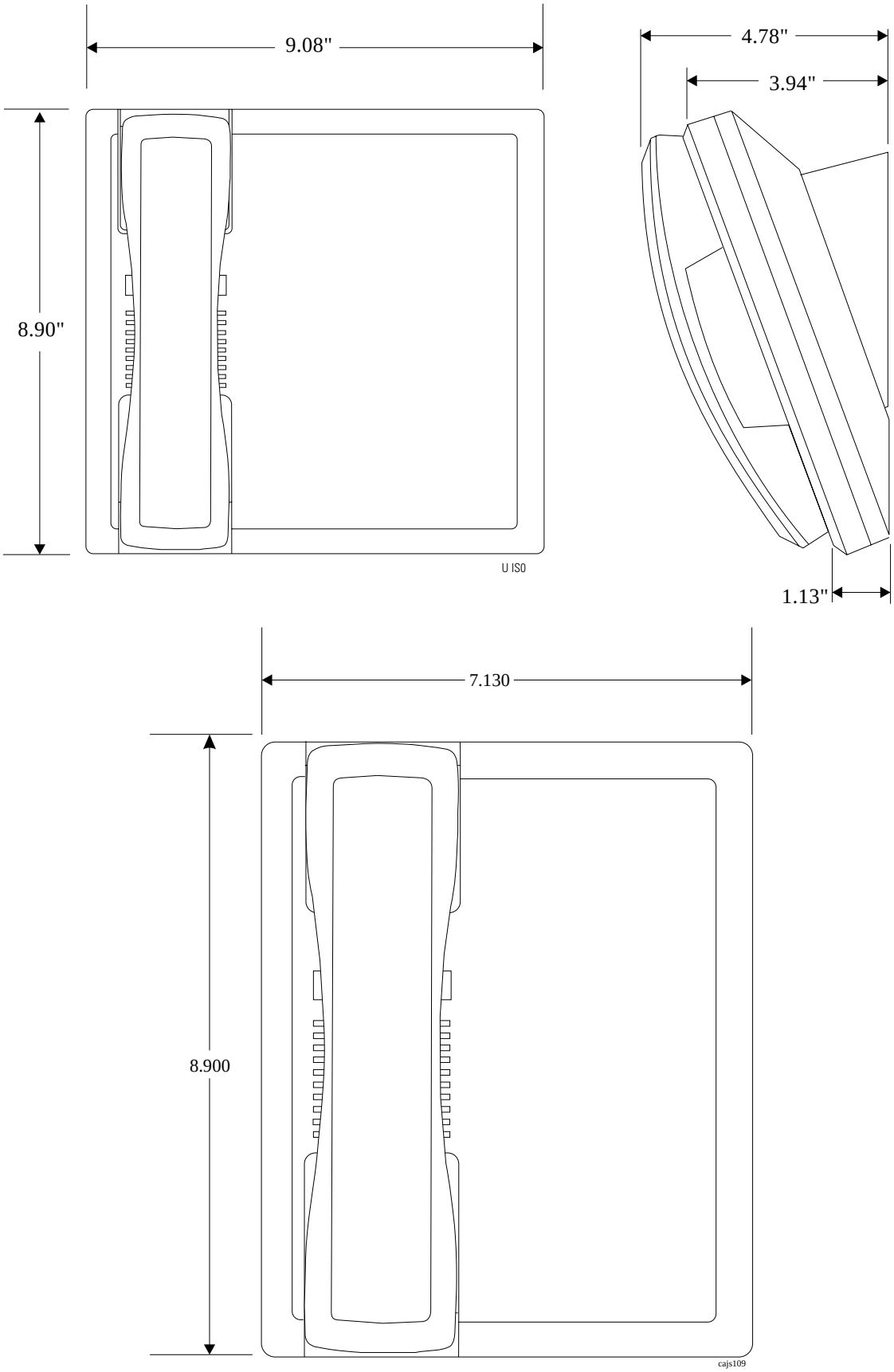
2101N (Single Line Proprietary Telephone)



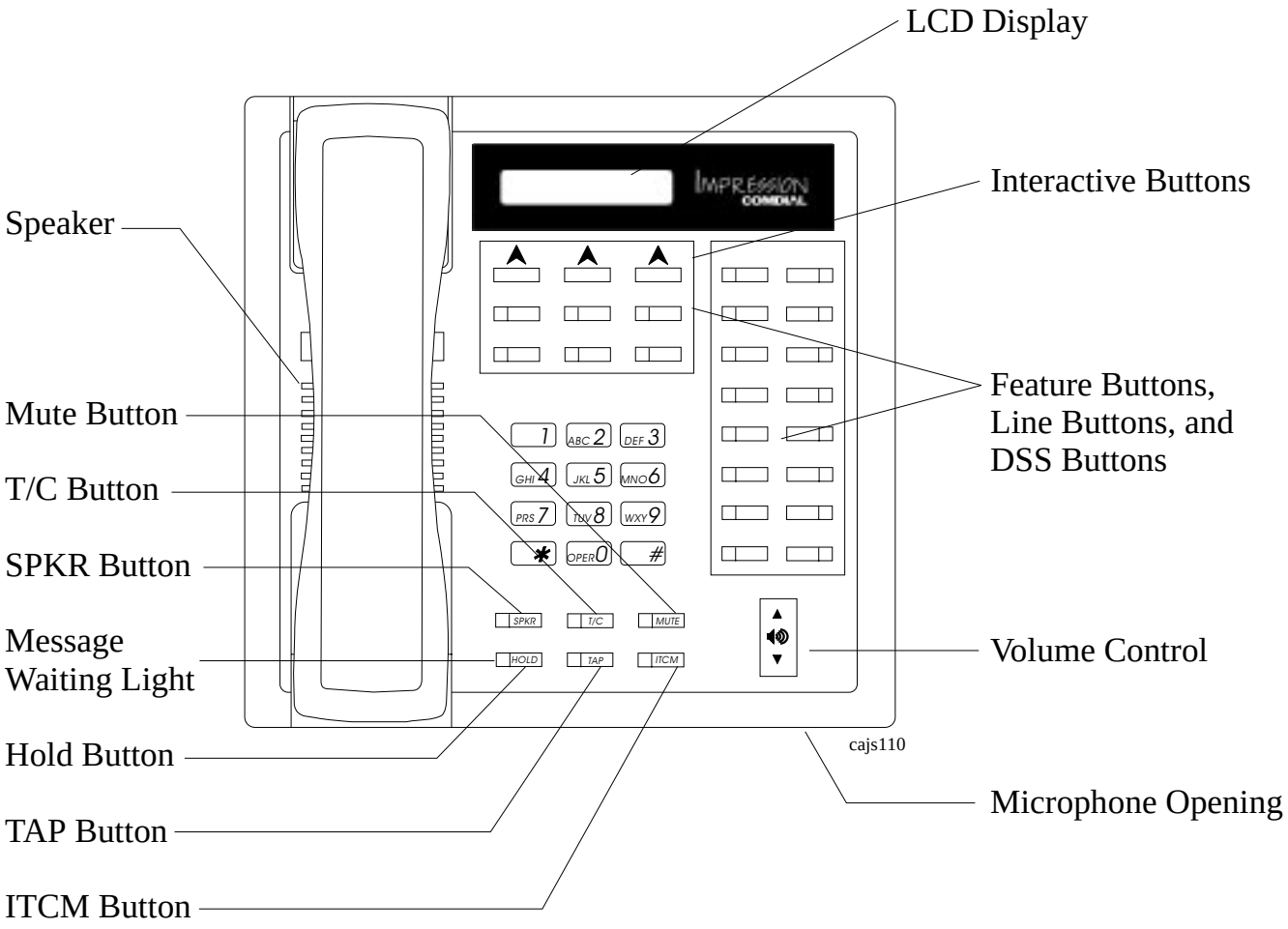
DU32X (32-Button DSS/BLF Console)

unisyn11.cdr

Impression Telephone Images



Impression Telephone Dimensions



Station Controls And Indicators On Impression Telephones

DXP

Digital Communications System

General Description For Software Release 11B

This publication reflects software release 11B.

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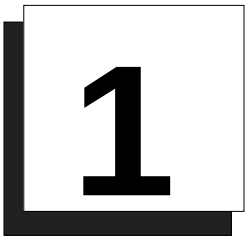
Comdial's Quality Management System Is Certified To The ISO 9001 Standard.

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Introducing Software Release 11B

Software release 11B contains new features and feature enhancements designed to make the DXP system easier for end users to use. The software changes and additions are as follows:

- ANI/DNIS Display
- PCIU/Visual Call Manager Support
- Phone Types Enhancement
- Restricted Login
- System Software Upgrade Enhancement
- Visual Voice Mail Support

Detailing The 11B Hardware Considerations

The DXP system must be operating on a DXCPU–68K CPU board. The 11B software release is not compatible with systems using a DXCPU–186 CPU board found in earlier DXP systems.

If you are upgrading to 11B from software 10A or later, you only need to change the software card (DXPSW–DLRC) on the existing Random Access Memory (RAM) board.

If you are upgrading to 11B from software 9A or earlier, you must use the DXPSW–DLRP package. In addition to the 11B software card, this package includes the following items that you must install as part of the software up-grade:

- new cabinet labeling for board configurations,
- new Random Access Memory (RAM) card (DXRAM–EXPC),
- VMMI programming software.

Detailing The 11B Software Considerations

- The PCMMI (off-line) programming procedure is no longer available with 11B software. A windows-based, Visual Man-Machine Interface (VMMI) on-line programming system with help files now replaces the PCMMI.
- The DXP database must be at least revision 9A before you can up-grade to 11B. You can use the 9A revision of the PCMMI programming software to up-load your current DXP database and then down-load it to a data storage area—such as your computer's hard drive—as a revision 9A database.* You must then use the the new VMMI feature to translate this stored 9A into an 11B database before you load it back into the DXP.
- The PC Attendant Position software must be at least revision 5A. (You must up-grade the software in your PC Attendant to this level to be compatible with the 11B software release.*) It is a good practice to up-grade the PC Attendant Position computer to contain at least 2 megabytes of RAM memory. While this may not be necessary for every installation, up-grading to 2 megabytes of RAM memory ensures that the PC Attendant Position functions properly under all conditions.

**Remember, you can download the latest VMMI, and PC Attendant software from the Comdial Technical Services Bulletin Board by calling 1-804-978-2583 or from the World Wide Web at: http://bbs.comdial.com.*

2 Explaining The Software 11B Features

Describing The 11B Features

ANI/DNIS Display

Software 11B adds the ANI/DNIS display feature. Automatic Number Identification (ANI) describes a code delivered by the subscriber service along with an incoming call. ANI identifies the number that the caller calls from. Dialed Number Identification Service (DNIS) also describes a code delivered by the subscriber service; however, DNIS identifies the number that the caller dialed. Systems can make use of these two services in different ways. One use is to show the ANI or DNIS information on the display of an LCD speakerphone. Through programming action, you can set the system for which bit of information (ANI or DNIS) that you wish to have display priority or you can set the system to show both bits of information in the display.

PCIU/Visual Call Manager Support

Beginning with software release 11B you can use the Personal Computer Interface Unit (PCIU) to operate the Visual Call Manager (VCM) capability of the Versatile Voice Processing (V.V.P.) voice mail system. VCM provides a series of computer-displayed menus that V.V.P. users can use to simultaneously view and manage voice message activity. By using a series of PC screen menus, users click their computer mouse to send, forward, save, delete, and listen to voice mail messages with the system digital speakerphone providing the sound. In addition, users select from different personal greetings, annotate saved messages, see the length of messages, and perform many other functions from the PC screen.

Installers connect the PCIU between a digital station port and that port's proprietary digital speakerphone and also to a user-supplied PC. The PCIU includes Service Provider Interface (SPI) and desk-top VCM software that installers load on the user-supplied PC. The SPI software, in conjunction with the VCM software, allows the PCIU to use the serial data path between it and the user-supplied PC to send messages to the PC and to the telephone's display.

Making the PCIU/Visual Call Manager operational requires only that installers make the proper connections as described in IMI89–286, *Installing The Personal Computer Interface Unit*, and load the SPI and VCM software on the user-supplied PC. There are no telephone system software programming requirements to activate the PCIU; however, installers must consider the following hardware parameters:

- the user-supplied PC must be running the Windows 3.1 or Windows 95 opeating system;
- the user-supplied PC must provide a serial data port (the PCIU includes a 9-pin to 9-pin cable serial data cable);
- the system software revision must be at 11B or later;
- the V.V.P. software revision must be at 8.2 or higher;
- the system station must be a Comdial proprietary LCD speakerphone with interactive buttons;
- the revision of the firmware on the digital station board must be at 5A or later.

NOTE: Contact your Inside Sales Representative for complete details concerning hardware availablity dates.

Phone Types Enhancement
(Telephone Types)

This programming feature allows you to identify the particular type of system telephone equipment that you or your installer will connect to each station port.

Beginning with software 11B, the digital communications system supports the installation of an integrated voice processing board as a digital station type selection. The model number of the Comdial integrated voice processing board is as follows: IVPC

You can also mark the station port equipment as undefined so that the system will not test the port for a specific type of equipment and will not include the port in any menu presentations.

NOTES:(1) Depending upon which equipment you choose, the system will present different sub-menus that allow you to further define the equipment as to the quantity of lines it can serve, whether it is a speakerphone, whether it is a DSS/BLF console, and other defining characteristics. Follow the sub-menu prompts and press ENTER after you have typed each selection.

(2) Contact your Inside Sales Representative for complete details concerning hardware availablity dates.

Restricted Login

Software release 11B, provides upward and backward compatibility between the different revisions of the VMMI programming software and the software of the system being programmed. This compatibility is for certain critical features and is known as restricted login. For example, restricted login permits programmers to use 11A VMMI software to execute certain programing features on an 11B system or use 11B VMMI software on 10A systems. Restricted login permits the programming of the following critical features across software revision platforms:

- archive any database;
- restore any database that has the same revision software as does the system to which the VMMI is connected;
- up-grade system software;
- reset the system;
- change the system passwords.

System Software Upgrade Enhancement

Beginning with software release 11B, digital communications system installers no longer need to accept an automatic save of an existing database during a system software upgrade. Installers can choose to maintain the existing data base by first archiving the data base, then upgrade the software, and finally restore the database after the upgrade is complete. Alternately, installers can choose to allow the system to clear the existing database with the master clear operation.

Visual Voice Mail Support

Visual Voice Mail (VVM) support provides proprietary, two-line display LCD speakerphone stations with visual messages and interactive buttons. This message and button fuctionality enhances the stations with visual messages and interactive buttons. This message and button functionality enhances the station's use with Comdial Versatile Voice Processing (V.V.P.) voice mail equipment.

The V.V.P. prompts the user to enter a password (if programmed to require one) before it plays the new messages. Once entered, the V.V.P. system provides presents convenient dynamic VVM features that enhance the voice message processing. **A dedicated V.V.P. user guide (GCA70–347), provides complete V.V.P. and VVM operating details.**

VVM causes the speakerphone to display a **VMAIL** button that users press to call the voice mail system. After they press this button, the system prompts them to enter a password. (This password is one that the programmer assigns to the stations.) Once users enter the password, the speakerphone's display shows the V.V.P.'s main menu. From there, users can select the operation they wish to persue. When there is a message waiting, the display shows the message quantity in place of the **VMAIL** button (for example, **5 MSG**). Users press the **MSG** button to play the stored messages.

The system does not require any programming action to implement VVM support; however, there are four additional now available DTMF integration digits that are used to signal call progress information to the Comdial V.V.P. voicemail system. The system defaults these values during a master clear operation and they will save across databases from one system to another. These defaulted values are applicable exclusively for Comdial V.V.P. voicemail systems and are detailed below.

Logon Digit

The telephone system transmits the logon digit to the V.V.P. voicemail system along with the station extension number whenever a station calls the V.V.P. voicemail system and finds that the voicemail system has no messages for that station. The V.V.P. voicemail system requires a value of **9**.

Logon With Messages Digit

The telephone system transmits the logon with messages digit to the V.V.P. voicemail system along with the station extension number whenever a station calls the V.V.P. voicemail system and finds that the voicemail system does have messages for that station. The V.V.P. voicemail system requires a value of **8**.

Ringing Digit

The telephone system transmits the ringing digit to the V.V.P. voicemail system when the voicemail system is calling a station and that station is ringing. The V.V.P. voicemail system requires a value of **4**.

Invalid Extension Digit

The telephone system transmits the invalid extension digit to the V.V.P. voicemail system when the voicemail system has dialed an invalid extension while attempting to call a station. The V.V.P. voicemail system requires a value of **5**.

3 Programming The 11B Features

Upgrading The DXP Software

To enable VMMI use on the DXP system, you must up-grade the DXP software to at least release 10A (or to whatever software revision that is now current). Further, to preserve your existing database you must convert it through the use of the PCMMI database programming software that is at software release 9*n*. The upgrade to software release 10A or later requires that you also install a new RAM card (DXRAM–EXPC) as well as the software memory card (DXPSW–DLRC) on the DXP's central processor unit. If you need detailed instructions for installing this circuit board and card, refer to the *DXP System Hardware Instructions* in your service literature.

To ensure that you execute the data base conversion and software up-grade correctly, you must perform the following detailed operations in the sequence listed below:

1. Convert The Database
2. Translate The Database
3. Install The Memory Card (and RAM Card if needed)
4. Master Clear The System
5. Reset The System
6. Connect To The System
7. Restore The Converted Database

Converting The DXP Database

Use this procedure to convert an existing DXP database to a software release 9A compatibility. This action places the database in an arrangement that allows you to translate it. Translating the database makes it compatible with software releases that support VMMI usage (software release 10A and later).

1. Employ a PC with an XMODEM communications program and use the DXP's embedded MMI programming method to store the current DXP database to the PC's hard drive. The saved database does not include the SMDA/SMDR records. If you need these SMDA/SMDR records, you must make a printout of them before you perform the database storage.
2. Disconnect the PC from the DXP.
3. Obtain a copy of revision 9A or later PCMMI programming software and load it on your computer. (Remember, you can always down load the latest PCMMI software from the Comdial Technical Services Bulletin Board by calling 1-804-978-2583 or from the Comdial home page on the World Wide Web by connecting at: http://www.comdial.com/).
4. If the stored database is not at least software release 9A, use the revision 9A or later PCMMI to convert the current DXP database to a software release 9A database.
5. Use the revision 9A or later PCMMI to down-load and store the software release 9A database to your computer's hard drive.

Translating The DXP Database

Use this procedure to translate a DXP database, which you have first converted to be compatible to software release 9A, to be compatible with software release 10A and later.

1. From the VMMI window, select the **File** pull-down menu.
2. Select **Open**. If necessary type the path location and DOS file name of the stored database that you wish to translate.
3. From the *Open Data Base File* window, select the database and **OK** your choice.
4. Select a file location for the translated database and **OK** your selection.
5. Select the destination program for the system to use. The *Select Board Type* window opens.
6. Use the *Select Board Type window* to describe the board configuration of the DXP database that you are translating.

   (a) Make a record of the DXP's physical board configuration for reference.

   (b) Use the board record information to answer the prompts on the *Select Board Type* window. The prompts first ask for all installed station boards beginning with the DXP's left-most universal slot in the main cabinet. The prompts then ask for all installed line boards beginning with the DXP's left-most line slot in the main cabinet. When a slot in the original DXP contains an auxiliary board, select the **No Board** response the prompt asks for a station board but a line board occupies that slot in the original DXP, select the **No Board** response. When the prompt asks for a line board but a station board occupies that slot in the original DXP, select the **No Board** response. When you finish listing the board configuration, **OK** your selections.

   (c) VMMI graphically shows the boards installed in a default arrangement and leaves a blank slot for any place that you answered a station or line board prompt with a no board response

   (d) Use your mouse to move the board images to match your plan.

   (e) From the **File** drop-down menu, select **SAVE**.

Master Clearing The DXP System

To insure that the DXP will perform properly with the new memory card, master clear the system. The DXCPU–68K board provides a method for the master clear to occur automatically at the initial power up after you have changed or upgraded the software card.

CAUTION

A master clear operation erases an existing database. If you wish to preserve the existing database, you must archive it before you master clear the system. You can then restore this database after you master clear the system. Remember, if this database is not at software release 10A or later, you must convert *and* translate *it.*

Execute the following sequence of events exactly as they are stated here:

1. On the DXPCPU–68K circuit board, set DIP switch 8 to its ON position.
2. Connect the DXP's AC power cord to the AC outlet and turn on the AC power switch. At power up, the DXP automatically executes a master clear operation. After the master clear sequence is complete, the indicators on the DXCPU–68K and DXSRV boards turn on steady and the indicators on the station and line boards wink ON for four seconds and OFF for four seconds. The system performs the automatic master clear one time following the initial power up after you have up-graded the software. It will not perform an automatic master clear operation again after subsequent power ups.
3. You can leave DIP switch 8 ON or you can turn it OFF. Leaving it ON will ensure that the DXP will always power up in a master cleared and operational mode after a software upgrade. Turning it off prevents the DXP from becoming operational at power up after a software upgrade. The OFF setting may be acceptable because, should you forget to save your database, you have an opportunity to reconsider your actions before the DXP erases the current database.

Resetting The DXP System

Some times you may need to reset you digital communications system. There are two methods for doing this.

1. You can press the **RESET** button on the CPU board to reset the system.
2. You can select **System Software Reset** from the VMMI **Switch** menu and **OK** the selection.

Connecting VMMI To A Remote System

1. From the **Connect To...** menu item, choose either **Administrator** or **Installer** and enter the appropriate password. The system defaults all passwords to I✳746✳; however, you can customize the passwords as part of VMMI programming if you wish.
2. Select the communications port that your PC uses to communicate with the communications system.
3. If you are operating remotely through a modem, check the modem prompt.
4. Select the serial data parameters that matches the requirements for the system or for the modem if you are connected remotely through a modem. (Comdial engineers recommend that you use a baud rate of 19.2 kilobaud to speed up the data transfer process. If you plan to operate at this higher data speed, first connect at the default rate, then use the VMMI programming menu to change the data parameters of the system, and finally use the **Connect To...** menu item to reconnect at the higher data speed.)
5. When you finish making the connection settings, click the **CONNECT** button to return to the **Switch** pull-down menu. the system responds by presenting its serial number at the bottom of the VMMI screen for your reference, and shows an on-line message.
6. Use the **Disconnect** menu item to disconnect from the system, archive or restore a system database, or down-load system software.

NOTE: If, for some reason, the system does not complete the connect procedure, check your cable connections, verify your serial data settings, and repeat the login procedure.

Restoring The Existing Database

1. From the **Switch** pull-down menu, select the **Connect To...** menu item, connect VMMI to the system, and return to the **Switch** pull-down menu.
2. From the **Switch** pull-down menu, select the **Restore Database** menu item.
3. Choose the memory storage location that contains an archived data base and **OK** your choice. The system automatically restores its data base.

DXP

Digital Communications System

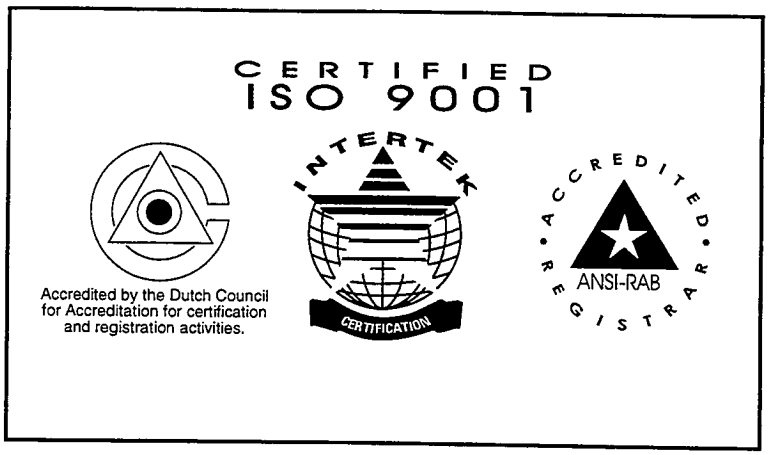
Programming Records

The record charts included in this publication reflect software releases through 9A.

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Comdial® strives to design the features in our communications systems to be fully interactive with one another. However, this is not always possible, as the combinations of accessories and features are too varied and extensive to insure total feature compatibility. Accordingly, some features identified in this publication will not operate if some other feature is activated.

Comdial® disclaims all liability relating to feature non-compatibility or associated in any way with problems which may be encountered by incompatible features. Notwithstanding anything contained in this publication to the contrary, Comdial makes no representation herein as to the compatibility of features.

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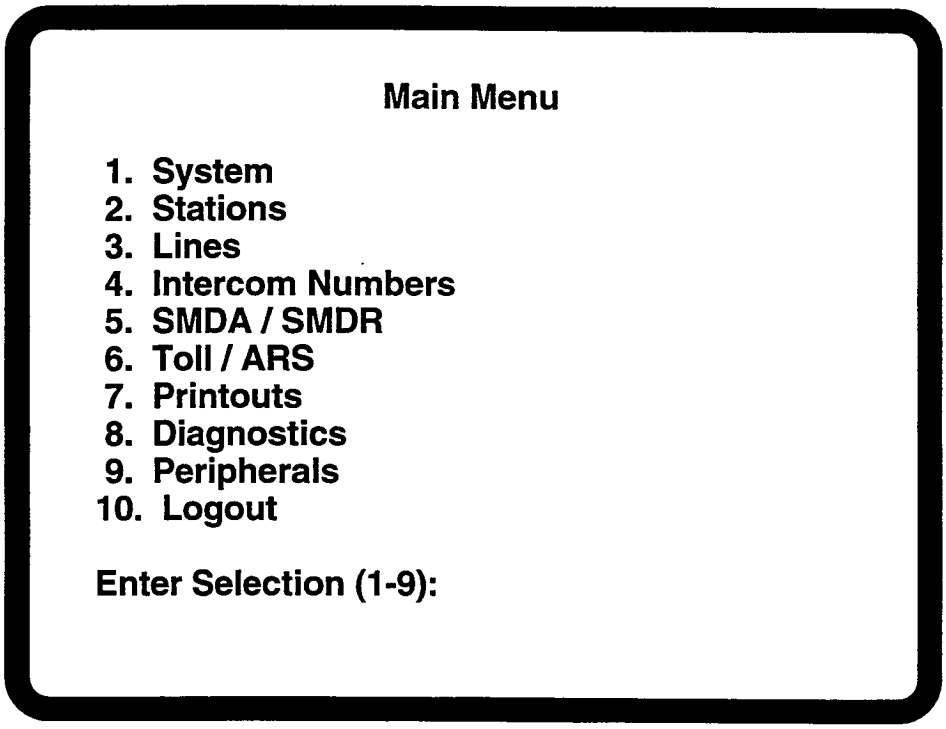
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1 Introduction

Use these record charts along with GCA40-112, DXP Digital Communications System General System Description, and IMI66-111, *Video Display Terminal Programming Instructions For The DXP Digital Communications System* to plan the system configuration and feature applications that best complement the site requirements.

- The charts are arranged in the same order that the VDT programming menus are presented.
- Use the index at the end of this publication to locate a programmable feature by name.



2 System Records

- From main menu, type selection number for system and press **ENTER**.
- From system menu, type selection number for feature and press **ENTER**.

System

1. Defaults
2. Terminal Setup
3. LCD Messages
4. Save/Restore Database
5. Serial Ports
6. SOHVA Table
7. Speed Dials
8. Time and Date
9. Timing
10. System Parameters
11. Paging Zones
12. Change Password
13. Feature Renumbering
14. T1 Status Log Parameters
15. Major Alarm Alerting

Enter Selection (1-13):

2.1 VDT Configuration (Terminal Setup)

ANSI Terminal	
ANSI Color Terminal	
WYSE 50 Terminal (default)	
Brief Display Mode	

2.2 LCD Messages

Number	Message (16 Characters Maximum)															
01	***B***	***a***	***c***	***k***		***a***	***t***									
02	***C***	***a***	***l***	***l***												
03	***A***	***s***	***k***		***T***	***h***	***e***	***m***		***T***	***o***		***H***	***o***	***l***	***d***
04	***T***	***a***	***k***	***e***		***A***		***M***	***e***	***s***	***s***	***a***	***g***	***e***		
05	***I***		***W***	***i***	***l***	***l***		***C***	***a***	***l***	***l***		***B***	***a***	***c***	***k***
06																
07																
08																
09																
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30																

Default = bold italic entries

2.3 Serial Data Port Records

Data Port	Baud Rate In	Baud Rate Out	Data Bits	Stop Bits	Paity	Flow Control
Main Data Port 1						
Main Data Port 2						
Aux Data Port 1						
Aux Data Port 2						
Aux Data Port 3						
Aux Data Port 4						
Aux Data Port 5						
Aux Data Port 6						
Aux Data Port 7						
Aux Data Port 8						
Aux Data Port 9						
Aux Data Port 10						
Aux Data Port 11						
ux Data Port 12						
Aux Data Port 13						
Aux Data Port 14						
Aux Data Port 15						
Aux Data Port 16						
Baud Rates = 150, 300, 600, 1200, 1800, 2400, 4800, 9600 / Data Bits = 7, 8 / Stop Bits = 1, 2 / Parity = None, Even, Odd Flow Control = None, Xon/Xoff, CTR/DTR						
Defaults: ***Data Port 1 = 9600, 9600, 8, 1, None, None*** ***Data Port 2 = 300, 300, 7, 2, None, None*** ***Aux Data Ports = 2400, 2400, 8, 1, None, None***						

2.3.1 Modem Setup

Feature	Default	Program Setting
Data Port	***main data port 2***	
Initialize String	***AT S0=1 M0 Q1 E0***	

2.4 Subdued Off-Hook Voice Announce Groups

		SOHVA Receive															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*
S	2	.	*	.	.	.	.	.	.	.	.	.	.	.	.	.	*
O	3	.	.	*	.	.	.	.	.	.	.	.	.	.	.	.	*
H	4	.	.	.	*	.	.	.	.	.	.	.	.	.	.	.	*
V	5	.	.	.	.	*	.	.	.	.	.	.	.	.	.	.	*
A	6	.	.	.	.	.	*	.	.	.	.	.	.	.	.	.	*
	7	.	.	.	.	.	.	*	.	.	.	.	.	.	.	.	*
T	8	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.	*
r	9	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.	*
a	10	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.	*
n	11	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.	*
s	12	.	.		.		.		.	.	.	.	*	.	.	.	*
m	13	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.	*
i	14	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.	*
t	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*	*
	16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

*Default = **

2.5 Speed Dial Records

2.5.1 Speed Dial Records 100—199

Dialing Code*	Line Selection**	Prefix***	Number****	Dialing Code*	Line Selection**	Prefix***	Number****

2.5.2 Speed Dial Records 200—299

Dialing Code*	Line Selection**	Prefix***	Number****	Dialing Code*	Line Selection**	Prefix***	Number****

2.5.3 Speed Dial Records 300–399

Dialing Code*	Line Selection**	Prefix***	Number****	Dialing Code*	Line Selection**	Prefix***	Number****

2.5.4 Speed Dial Records 400—499

Dialing Code*	Line Selection**	Prefix***	Number****	Dialing Code*	Line Selection**	Prefix***	Number****

2.5.5 Speed Dial Records 500–599

aling ode*	Line Selection**	Prefix***	Number****	Dialing Code*	Line Selection**	Prefix***	Number****

2.6 Timing

Call Park Recall	0 sec	1 min	***2 min***	3 min	4 min	5 min	6 min				
Page Recall	0 sec	1 min	***2 min***	3 min	4 min	5 min	6 min	7 min	8 min	9 min	10 min
Camp-On Tone	5 sec	10 sec	***15 sec***	30 sec	1 min	2 min	3 min	4 min	8 min		
DTMF Extended Dialing	***80 ms***	160 ms	240 ms	320 ms	400 ms	560 ms	720 ms	880 ms	1.04 s		
Hold Recall	0 sec	30 sec	1 min	1.5 min	***2 min***	3 min	4 min	5 min	6 min	7 min	
Attendant Hold Recall	0 sec	30 sec	1 min	1.5 min	***2 min***	3 min	4 min	5 min	6 min	7 min	
Paging Access	***20 sec***	30 sec	1 min	1.5 min	2 min	2.5 min	3 min				
Pause	500 ms	***1 sec***	1.5 sec	2 sec	3 sec	5 sec	7.5 sec	10 sec	15 sec	20 sec	
Recall/Flash	110 ms	300 ms	500 ms	600 ms	750 ms	880 ms	***1 sec***	1.5 sec	2 sec	2.5 sec	
Station Transfer Recall	0 sec	10 sec	***20 sec***	25 sec	30sec	45 sec	1 min	1.5 min	2 min	3 min	4 min
Periodic Line Tone	1 min	2 min	***5 min***	10 min	15 min						
Maximum Call Duration Time	2 min	5 min	***10 min***	15 min	30 min						
Internal Interdigit Dialing	5 sec	***10 sec***	15 sec	20 sec	25 sec						
Max. Line-To-Line Connect Duration	0 sec	1 min	5 min	9 min	13 min	17 min	21 min	25 min	***30 min***	Never*	
Camp On/Auto Call Back Ring	0 sec	10 sec	***20 sec***	25 sec	30 sec	45 sec	1 min	1.5 min	2 min	3 min	4 min
Out Dial Delay Time	500 ms	***1 sec***	1.5 sec	2 sec	2.5 sec	3 sec	3.5 sec	4 sec	4.5 sec	5 sec	
Authorization Code Time	0 sec	5 sec	***10 sec***	15 sec	20 sec	25 sec	30 sec				
IST Ring Timeout	1 min	1.25 m	1.5 m	1.75 m	2 min	3 min	4 min	***Never***			
IST DTMF Receive Timeout	5 sec	10 sec	15 sec	***20 sec***	25 sec	30 sec	35 sec	40 sec	45 sec		
IST MInimum Flash Time	110 ms	***200 ms***	300 ms	400 ms							
IST Maximum Flash Time	500 ms	600 ms	***750 ms***	880 ms	1 sec	1.5 sec					
Voice Mail DTMF Digit	***80 ms***	160 ms	240 ms	320 ms	400 ms	560 ms	720 ms	880 ms	1.04 s		
Pulse Dial Interdigit	100 ms	***200 ms***	300 ms	400 ms	500 ms	600 ms	700 ms	800 ms	900 ms	1 sec	
Pulse Dial Make	0–99 ms ***(40 ms)***										
Pulse Dial Break	0–99 ms ***(60 ms)***										
Periodic Conference Tone	2 sec	5 sec	10 sec	15 sec	***30 sec***	1 min	2 min	3 min	5 min		
Periodic Executive Override Tone	***2 sec***	5 sec	10 sec	15 sec	30 sec	1 min	2 min	3 min	5 min		
To make a programming record, check the block showing the desired setting.											
Default = values shown in bold italic type.											

**NOTE: Be careful when choosing this never recall option for systems that have loop start without disconnect supervision. Both distant parties can leave an unsupervided conference thus leaving the line unused yet still avtive. The line will remain active until the person that set the conference rejoins it to disconnect the line.*

2.7 System Parameters

Synchronized Ringing		*No*	Yes
Automatic Attendant Immediate Transfer		*No*	Yes
ARS (Automatic Route Selection)		***Disabled***	Enabled
ARS Dial Tone	*1*	2	3
System Status Reporting		***Disabled***	Enabled
T1 Status Reporting		***Disabled***	Enabled
Central Message Desk	***None***	Name	Number
IST Ringing Per Phase		*8*	16
IST Ringing Modes		***Mode 1 (2 sec.)***	Mode 2 (1 sec.)
IST Ring Frequency		***21 Hz***	25 Hz
Operator Station	***101***	Name	Number
Line Disconnect Auto Camp-on		Disabled	***Enabled***
Automatic Station Relocation		***Disabled***	Enabled
Default Relocation Response		No	***Yes***
Ringback Tone		***Tone 1***	Tone 2
Day 1 Begin Time (24 Hour)	***None***	Hour–	Minute–
Day 1 End Time (24 Hour)	***None***	Hour–	Minute–
Day 2 Begin Time (24 Hour)	***None***	Hour–	Minute–
Day 2 End Time (24 Hour)	***None***	Hour–	Minute–
Night Begin Time (24 Hour)	***None***	Hour–	Minute–
Night End Time (24 Hour)	***None***	Hour–	Minute–
Location Code		***1 = USA***	2 = South Africa
		3 = Brazil	4 = Argentina and Chile
To make a programming record, check the block showing the desired setting.			
Default = values shown in bold italic type.			

2.8 Zone Paging

Zone 1 *(Defaults to All-Call)* *	Record
Zone Name	
Transmit Stations (101-292)	
Receive Stations (101-292)	
Relay Assigned (1-4)	
External Paging Port Assigned 0=No 1=yes	

Zone 2	Record
Zone Name	
Transmit Stations (101-292)	
Receive Stations (101-292)	
Relay Assigned (1-4)	
External Paging Port Assigned 0=No 1=yes	

Zone 3	Record
Zone Name	
Transmit Stations (101-292)	
Receive Stations (101-292)	
Relay Assigned (1-4)	
External Paging Port Assigned 0=No 1=yes	

Zone 4	Record
Zone Name	
Transmit Stations (101-292)	
Receive Stations (101-292)	
Relay Assigned (1-4)	
External Paging Port Assigned 0=No 1=yes	

Zone 5	Record
Zone Name	
Transmit Stations (101-292)	
Receive Stations (101-292)	
Relay Assigned (1-4)	
External Paging Port Assigned 0=No 1=yes	

Zone 6	Record
Zone Name	
Transmit Stations (101-292)	
Receive Stations (101-292)	
Relay Assigned (1-4)	
External Paging Port Assigned 0=No 1=yes	

Zone 7	Record
Zone Name	
Transmit Stations (101-292)	
Receive Stations (101-292)	
Relay Assigned (1-4)	
External Paging Port Assigned 0=No 1=yes	

Zone 8	Record
Zone Name	
Transmit Stations (101-292)	
Receive Stations (101-292)	
Relay Assigned (1-4)	
External Paging Port Assigned 0=No 1=yes	

**Default = zone 1 is all-call, zones 2—8 not assigned.* This means stations 101—292 are assigned to both transmit and receive in zone 1 and none are assigned in any other zone. Also, no external paging port is assigned.

2.9 Relays

Relay 1*	Record
Direct Ring LInes (1-128)	
Delayed Ring Lines (1-128)	
Day 1 Ring Lines (1-128)	
Day 2 Ring Lines (1-128)	
Night Ring Lines (1-128)	

Relay 2*	Record
Direct Ring LInes (1-128)	
Delayed Ring Lines (1-128)	
Day 1 Ring Lines (1-128)	
Day 2 Ring Lines (1-128)	
Night Ring Lines (1-128)	

Relay 3*	Record
Direct Ring LInes (1-128)	
Delayed Ring Lines (1-128)	
Day 1 Ring Lines (1-128)	
Day 2 Ring Lines (1-128)	
Night Ring Lines (1-128)	

Relay 4*	Record
Direct Ring LInes (1-128)	
Delayed Ring Lines (1-128)	
Day 1 Ring Lines (1-128)	
Day 2 Ring Lines (1-128)	
Night Ring Lines (1-128)	

** Default = no relays assigned*

2.10 External Paging Port

Line Type*	Record
Direct Ring LInes (1-128)	
Delayed Ring Lines (1-128)	
Day 1 Ring Lines (1-128)	
Day 2 Ring Lines (1-128)	
Night Ring Lines (1-128)	

** Default = none assigned*

2.11 Change Password

Entry (System Administrator)	
Installer (Installer/programmer)	
Station (Programming Station)	

** Entry and Installer Default = 1 ✳746 ✳*
Station Default = ITCM button, ✳ #746 ✳
(6 = password portion)

2.12 Feature Renumbering

Feature Name	Default	New
Park Orbits		
Park Orbit Send 1	✳91	
Park Orbit Sent 2	✳92	
Park Orbit Send 3	✳93	
Park Orbit Send 4	✳94	
Park Orbit Send 5	✳95	
Park Orbit Send 6	✳96	
Park Orbit Send 7	✳97	
Park Orbit Send 8	✳98	
Park Orbit Send 9	✳99	
Park Orbit Receive 1	#91	
Park Orbit Receive 2	#92	
Park Orbit Receive 3	#93	
Park Orbit Receice 4	#94	
Park Orbit Receive 5	#95	
Park Orbit Receive 6	#96	
Park Orbit Receive 7	#97	
Park Orbit Receive 8	#98	
Park Prbit Receive 9	#99	
Line Groups		
Line Group 1	9	
Line Group 2	80	
Line Group 3	81	
Line Group 4	82	
Line Group 5	83	
Line Group 6	84	
Line Group 7	85	
Line Group 8	86	
Line Group 9	87	
Line Group 10	88	
Line Group 11	89	
Line Group 12	60	
Line Group 13	61	
Line Group 14	62	
Line Group 15	63	
Line Group 16	64	
Page and Line Answer From Any Station (TAFAS) Zones		
Page Zone 1	70	
Page Zone 2	71	
Page Zone 3	72	
Page Zone 4	73	
Page Zone 5	74	
Page Zone 6	75	
Page Zone 7	76	
Page Zone 8	77	
Meet-Me Page	78	
TAFAS Zone 1	65	
TAFAS Zone 2	66	
TAFAS Zone 3	67	
TAFAS Zone 4	68	
TAFAS All Zones	69	

Feature Name	Default	New
User Features		
Backgound Music 1	✳11	
Background Music 2	✳12	
Background Music Off	#1	
Volume Save	✳✳7	
Operator	0	
Account Code Entry	✳04	
Call Forward Cancel	#5	
Call Forward Personal	✳51	
Call Forward All Calls	✳52	
Call Forward Per. (RNA)	✳53	
Call Forward All (RNA)	✳54	
Camp-On Activate	✳6	
Camp -On Cancel	#6	
Call Pickup Directed	✳4	
Call Pickup Group	#4	
Authorization Code Entry	#08	
DSS Programming	✳✳3	
Executive Override	✳03	
LCD Messaging Activate	✳02	
LCD Messaging Cancel	#02	
Message Waiting Activate	✳3	
Message Waiting Cancel	#3	
Call Divert	✳55	
Query	✳✳8	
Personal Ring Tone 1	✳✳41	
Personal Ring Tone 2	✳✳42	
Personal Ring Tone 3	✳✳43	
Personal Ring Tone 4	✳✳44	
Personal Ring Tone 5	✳✳45	
Personal Ring Tone 6	✳✳46	
Directed Station Hold On	✳90	
Service Observe	#03	
Speed Dial Programming	✳✳1	
Directed Station Hold Off	#90	
Voice Announce Block On	✳2	
Voice Announce Block Off	#2	
LCD Contrast (Analog Telephones)	✳✳5	
Response Message	✳✳6	
Pick-Up Last Line*	✳08	
Broker's Mode*	✳07	
Access Code For Spd. Dial*	✳01	
Saved Number Redial*	✳06	
Dial Saved Number*	✳09	
Remote Station Disable	✳05	
Remote Station Enable	#05	
Message Wait Retrieval*	#00	
Tracker Page Pickup	#8	
Tracker Access	✳8	
Pager Disable	#06	
Pager Enable	#07	
Clear Major Alarm Ring	#09	
Call Forward Off Site	Future feature—not currently available	
DISA Access	No default provided	
Do Not Distrub*	#01	
Station LockOn/Off	#04	
TAP Dialing Code*	##	

**For Single Line Proprietary Telephones and Industry-Standard Telephones*

2.12.1 Station Programming

System Manager Programming Program Entry Code	✳#74	
ɛndant Programming ɔgram Entry Code	✳#0	

2.13 Enabling T1 Status Reporting And Major Alarm Alerting

Feature	Settings*		Default
T1 Status Reporting	Enabled	Disabled	Disabled
Major Alarm Alerting	Enabled	Disabled	Disabled

*Mark block to match desired setting

NOTE: The T1 status reporting and major alarm alerting parameters are described in the instructions, "Installing And Programming The DXPT1 Digital Carrier Transmission Option," IMI89-141. These instructions should be located in this book under the installation tab.

2.14 T1 Status Logging

Error Type	Threshold		Time Period	
	Range	Selection	Range	Selection
1. Bipolar Error Alarm Trigger	0-255		None	1 Sec
2. Bipolar Error Logging	0-999		See Note A	
3. CRC Error Alarm Trigger	0-255		None	1 Sec
4. CRC Error Logging	0-999		See Note A	
5. Slip Errors	0-999		See Note B	
6. PLL Errors	0-999		See Note A	
7. Transmit Slip Errors	0-999		See Note B	
8. Loss of Sync	0-999		See Note B	
9. Blue Alarms	0-999		See Note B	
10. Loss of Signal	0-999		See Note B	
11. Primary/Sec Sync Ref Switch	0-999		See Note B	
12. Sync Phase Lock Error	0-999		See Note B	
13. Yellow Alarms	0-999		See Note B	
14. Red Alarms	0-999		See Note B	
Defaults: Thresholds = 0; Time Periods = 1 Sec (for Error Types 1-4 and 6) and 1 Min (for Error Types 5 and 7-14)				

***NOTE A:** Choices are 1, 5, 30 Sec; 1, 5, 10 Min; 1 Hr*
***NOTE B:** Choices are 1, 5, 10, 30 Min; 1, 2, 12, 24 Hr*

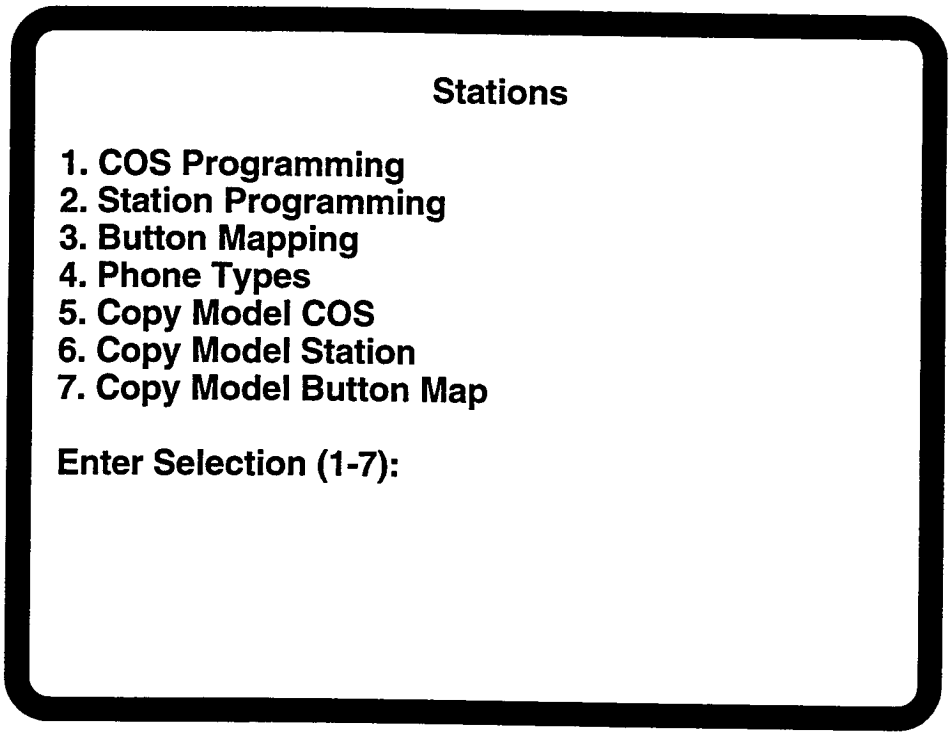
2.15 Major Alarm Alerting

Error Type	Threshold		Time Period	
	Range	Selection	Range	Selection
1. Bipolar Error	0-999		See Note A	
2. CRC Error	0-999		See Note A	
3. Slip Errors	0-999		See Note B	
4. PLL Errors	0-999		See Note A	
5. Transmit Slip Errors	0-999		See Note B	
6. Loss of Sync	0-999		See Note B	
7. Blue Alarms	0-999		See Note B	
8. Loss of Signal	0-999		See Note B	
9. Primary/Sec Sync Ref Switch	0-999		See Note B	
10. Sync Phase Lock Error	0-999		See Note B	
11. Yellow Alarms	0-999		See Note B	
12. Red Alarms	0-999		See Note B	
Defaults: Thresholds = 0; Time Periods = 1 Sec (for Error Types 1, 2, and 4) and 1 Min (for Error Types 3 and 5-12)				

NOTE A: *Choices are 1, 5, 30 Sec; 1, 5, 10 Min; 1 Hr*
NOTE B: *Choices are 1, 5, 10, 30 Min; 1, 2, 12, 24 Hr*

3 Station Records

- From main menu, type selection number for station menu and press **ENTER**.
- From station menu, type selection number for feature and press **ENTER**.



3.1 COS Programming

(Copy This Sheet As Needed To Meet System COS Capacity)

Feature	Choice	COS Defaults*			Class Of Service Records (Enter COS number at column head.)		
		32	1	2–31			
Account Code	YES NO	Yes	No	No			
Auto Hold on Intercom	YES NO	No	No	No			
Auto Hold on Lines	YES NO	No	Yes	No			
Background Music	YES NO	Yes	No	No			
Call Cost Display	YES NO	No	No	No			
Call Forward All	YES NO	Yes	Yes	No			
Call Forward Busy/RNA	YES NO	Yes	Yes	No			
Call Forward Personal	YES NO	Yes	Yes	No			
Call Forward Off Site	*Future Feature. Not currently active*						
Call Park Access	NONE, 1–9 1–9	1–9	None				
Call Pick-up	YES NO	Yes	Yes	No			
Call Waiting	YES NO	Yes	Yes	No			
Tracker Access	YES NO	Yes	Yes	No			
Enhanced LCD Display	YES NO	No	No	No			
Camp-On Originate	YES NO	Yes	Yes	No			
Camp-On Receive	YES NO	Yes	Yes	No			
Do Not Disturb Inhibit	YES NO	No	No	No			
Do Not Disturb Override	YES NO	No	No	No			
Exclusive Hold	YES NO	Yes	Yes	No			
Executive Override	YES NO	No	No	No			
Executive Override Block	YES NO	No	No	No			
Idle Line Preference	YES NO	No	No	No			
IST Distinctive Ringing	YES NO	No	Yes	No			
LCD Messaging	YES NO	Yes	No	No			
Meet Me Page	YES NO	Yes	No	No			
Message Deposit	YES NO	Yes	No	No			
Message Wait Originate	YES NO	Yes	Yes	No			
Music/Tone On Intercom Hold	NONE 1, 2, Tone	1	None	None			
Paging Receive	YES NO	Yes	No	No			
Paging Transmit	YES NO	Yes	Yes	No			
Ringing Preference	YES NO	Yes	Yes	No			
Day Route Access	1–4	4	4	1			
Night Route Access	1–4	4	4	1			
Day Restriction Level	1–8	1	1	1			
Night Restriction Level	1–8	1	1	1			
System Speed Dial Groups	NONE, 1–20	1-20	1-20	None			
Station Monitoring	YES NO	No	Yes	No			
Directed Station Hold	YES NO	Yes	Yes	Yes			
Remote Station Disable	YES NO	Yes	Yes	Yes			
Remote Day Exception Numbers	NONE, 1–32	None	None	None			
Remote Night Exception Numbers	NONE, 1–32	None	None	None			
Line Answer	Line No.	1-128	1–128	None			
Line Originate	Line No.	1-128	1–128	None			
Periodic Line Tone	Line No.	None	None	None			
Maximum Call Duration	Line No.	None	None	None			
Conference Advisory Tone**	None, Once, Periodic	None	None	None			
Executive Override Advisory Tone**	None,Once, Periodic	None	None	None			
Line Group Access	NONE, 1–16	1–16	1–16	None			
Line Group Queue	YES NO	Yes	No	No			
Line to Line Transfer	YES NO	No	No	No			
Voice Announce Block	YES NO	Yes	No	No			
Internal IST Flash	YES NO	No	Yes	No			
Forced Account Codes	YES NO	No	No	No			
Allow Busy Display	YES NO	No	No	No			
Clear Major Alarm Ring	YES NO	Yes	Yes	No			
High Handset Volume	YES NO	No	No	No			
Restrict ARS Hookflash	YES NO	No	No	No			
Quick Transfer	YES NO	No	No	No			

**Defaults: Stations 101 and 102 = COS 1, all other stations = COS 32, and COS 2–31 are unassigned.*

***Default =* **None** *when system parameters location code is 1, 2, or 4; however, default =* **Periodic** *when system parameters location code is 3.*

3.2 Station Programming

(Copy This Sheet As Needed To Meet System Station Capacity)

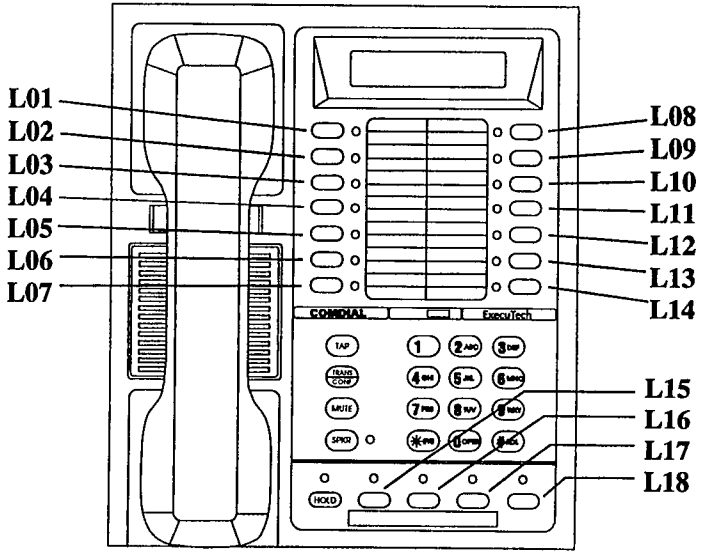
Port Type and Number	
Telephone Model	
Location	

Feature	Choice	Station Defaults			Station Record
		101	Others	Voice Mail	
Personal Intercom Number		*101*	*Sta. Nmbr.*	*Sta. Number*	
Station Name					
Class Of Service	1—32	*1*	*32*	*32*	
Speed Dial Sets	1—10	*3*	*3*	*3*	
Idle Line Priority	None, 1—28	*None*	*None*	*None*	
Intercom Hunt List	ITCM Numbers	*101, 3101-3104*	*Sta. Nmbr.*	*None*	
Group Intercom Access	ITCM Numbers	*3101-3104*	*None*	*None*	
Prime Type	None, Line, Gp. Itcm.	*None*	*None*	*Itcm*	
Line	Name, Number	*1*	*1*	*1*	
Line Group	1–16	*1*	*1*	*1*	
Intercom	Name, Number	*101*	*Sta. Nmbr.*	*Sta. Nmbr.*	
Tone First	*Yes, No*	*No*	*No*	*Yes*	
Call Announce Beeps	1–6	*1*	*1*	*1*	
Default Forward Type	Itcm. Fwd., No Fwd.	*No Fwd.*	*No Fwd.*	*Itcm Fwd.*	
Intercom Nmbr. Fwd. To	Itcm. Number	*101*	*Sta. Nmbr.*	*Lnk'd Sta. Nmbr.*	
Forward Type	Personal, All	*Personal*	*Personal*	*All*	
Forward RNA Ring Busy	Yes, No	*No*	*No*	*No*	
Direct Ring	None, 1–128	*1—128*	*None*	*None*	
Delayed Ring	None, 1–128	*None*	*None*	*None*	
Day 1 Ring	None, 1–128	*None*	*None*	*None*	
Day 2 Ring	None, 1–128	*None*	*None*	*None*	
Night Ring	None, 1–128	*None*	*None*	*None*	
Caller ID Ring No-Answer	None, 1–128				
Ring No-Answer Rings	None, 1–6	*4*	*4*	*3*	
Personal Ringing Tone	1–8	*Defaults vary with each station port number*			
LCD Contrast	1–8	*5*	*5*	*5*	
Initiate Service Observe	Yes, No	*No*	*No*	*No*	
Service Observable	Yes, No	*No*	*No*	*No*	
ARS Day Exception Number	None, 1–32	*1–3*	*1–3*	*1–3*	
ARS Night Exception Number	None, 1–32	*1–3*	*1–3*	*1–3*	
SOHVA Beeps	1–6	*6*	*6*	*6*	
SOHVA Groups	None, 1–16	*None*	*None*	*None*	
Busy On SOHVA	Yes, No	*No*	*No*	*No*	
Pick-Up Groups	None, 1–16	*1*	*1*	*1*	
Through Dialing	Yes, No	*No*	*No*	*Yes*	
Single Line TAP	Call Wait Ans., Xfr.	*Call Wt.*	*Call Wt.*	*Call Wt.*	
Ring On Busy	Yes, No	*Yes*	*Yes*	*Yes*	
Allow Ringer Off	Yes, No	*Yes*	*Yes*	*Yes*	
Disabled	Yes, No	*No*	*No*	*No*	
Consoles Installed	Yes, No	*No*	*No*	*No*	
Console Ports	None, 1—192	*None*	*None*	*None*	
Programming Port	Yes, No	*Yes*	*Yes*	*Yes*	
Auto Attdt. Xfer on Busy	Yes, No	*No*	*No*	*No*	
Headset	Yes, No	*No*	*No*	*No*	
Recall Call Forward	Yes, No	*No*	*No*	*No*	
Attendant	Yes, No	*Yes*	*No*	*No*	
Alternate Attendant	Name, Number	*102*	*None*	*None*	
Overflow Attendant	Name, Number	*102*	*None*	*None*	
Extended DTMF Dialing	Yes, No	*No*	*No*	*No*	
Softkey Setup	Yes, No	*No*	*No*	*No*	
IST Hold Cofiguraion	Yes, No	*No*	*No*	*No*	
Transfer Ring Cadence	Cadence 1, Cadence 2	*Cadence 1*	*Cadence 1*	*Cadence 1*	
Ring Back On Busy	Yes, No	*No*	*No*	*No*	
Line Out Softkey Options*	CONF SAVE ARDL CONF SAVE RLSE	*CONF SAVE ARDL*			

Default = ARDL when system parameters location code is 1, 2, or 4 ; however, default = RLSE when system parameters location code is 3.

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



LCD
Speakerphone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

BUTTON ASSIGNMENT CHART			
L01		L10	
L02		L11	
L03		L12	
L04		L13	
L05		L14	
L06		L15	
L07		L16	
L08		L17	
L09		L18	

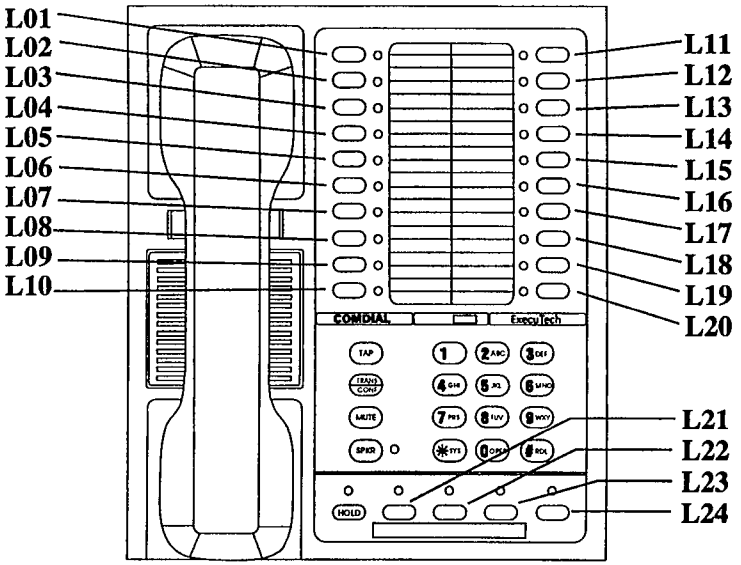
BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101	
L01 = SHIFT	L10 = PARK 3
L02 = QUEUE	L11 = PARK 2
L03 = OVRFL	L12 = PARK 1
L04 = I3101	L13 = ALTRN
L05 = I3102	L14 = MGMT
L06 = I3103	L15 = ANSWR
L07 = I3104	L16 = RLSE
L08 = PAGE 1	L17 = MSGWT
L09 = PARK 4	L18 = I101

CAJS069

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



CAJS069A

5x20 Telephone

☐ Speakerphone

☐ Monitor Telephone

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

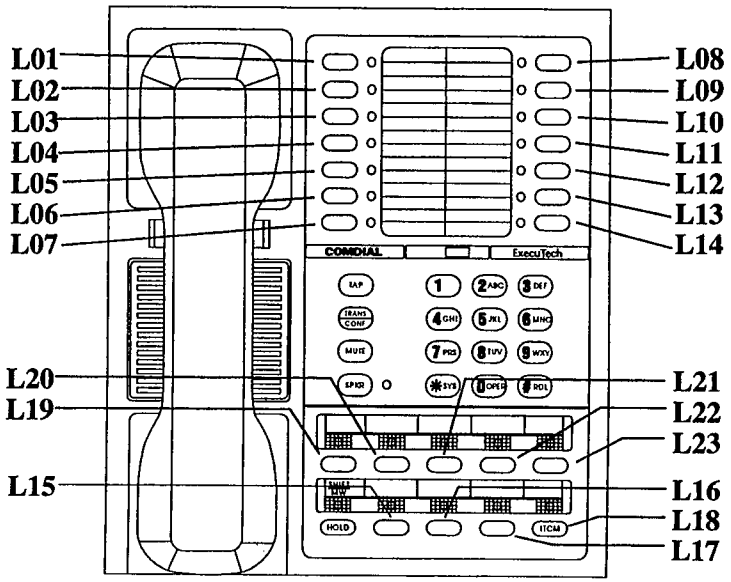
BUTTON ASSIGNMENT CHART			
L01		L13	
L02		L14	
L03		L15	
L04		L16	
L05		L17	
L06		L18	
L07		L19	
L08		L20	
L09		L21	
L10		L22	
L11		L23	
L12		L24	

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN.	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD.	Auxiliary Record Btn.
ARING.	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP.	Directed Call Pick Up
DSTAT.	DSS Status Button
EXOVR	Executive Override
FEATR.	Feature Button
FWD-A.	Forward All Button
FWD-P.	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP.	Forward Personal RNA Btn.
GPLSN.	Group Listen Btn.
GPKUP.	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS.	LCD Messaging Btn.
LNG##.	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG.	Meet-Me Page Btn.
MSGWT.	Message Waiting Btn.
MUSC#.	Music Source (1, 2)
NIGHT.	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL.	Overflow Button
PAGE#.	Paging Zone Btn. 1-8
PARK#.	Park Orbit Button 1-9
PRVCY.	Privacy Button
QUEUE.	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL.	Speed Dial
SILNT	Silent Ringer Button
SOHVA.	SOHVA Button
SPLIT	Split Button
SRIAL.	Serial Call Button
SYSST.	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY.	Line Test Busy Button
TRACK.	Tracker Pager Activate Button
VABLK.	Voice Announce Block Btn.
VOLSV.	Save Volume Button
XVM##.	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101	
L01 = SHIFT	L13 = PARK 3
L02 = QUEUE	L14 = PARK 2
L03 = OVRFL	L15 = PARK 1
L04 = I3101	L16 = ALTRN
L05 = I3102	L17 = NIGHT
L06 = I3103	L18 = ###
L07 = PARK 3	L19 = ###
L08 = ###	L20 = ###
L09 = ###	L21 = ANSWR
L10 = ###	L22 = RLSE
L11 = PAGE 1	L23 = MSGWT
L12 = PARK 4	L24 = I101

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



10x14 Telephone

☐ Speakerphone

☐ Monitor Telephone

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

CAJS069B

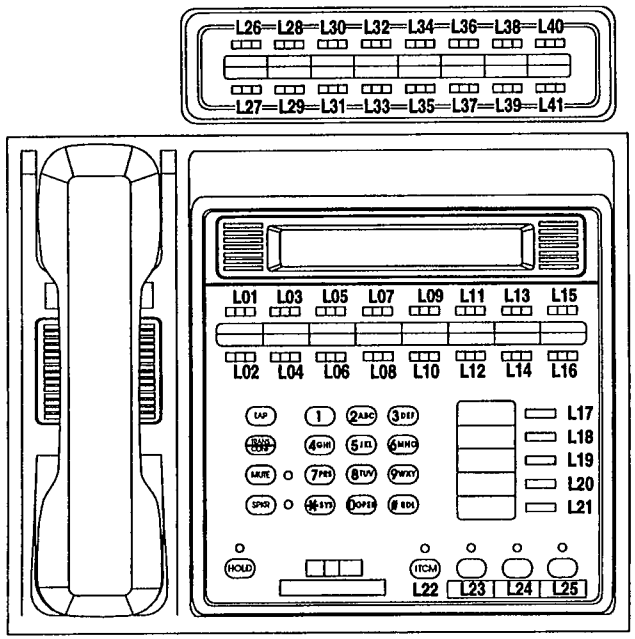
BUTTON ASSIGNMENT CHART			
L01		L13	
L02		L14	
L03		L15	
L04		L16	
L05		L17	
L06		L18	
L07		L19	
L08		L20	
L09		L21	
L10		L22	
L11		L23	
L12			

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101	
L01 = SHIFT	L13 = ALTRN
L02 = QUEUE	L14 = NIGHT
L03 = OVRFL	L15 = ANSWR
L04 = I3101	L16 = RLSE
L05 = I3102	L17 = MSGWT
L06 = I3103	L18 = I101
L07 = I3104	L19 = ###
L08 = PAGE 1	L20 = ###
L09 = PARK 4	L21 = ###
L10 = PARK 3	L22 = ###
L11 = PARK 2	L23 = ###
L12 = PARK 1	

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



19-Button Telephone

- ☐ LCD Speakerphone
- ☐ Speakerphone
- ☐ Monitor Telephone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

BUTTON ASSIGNMENT CHART					
L01		L15		L29	
L02		L16		L30	
L03		L17		L31	
L04		L18		L32	
L05		L19		L33	
L06		L20		L34	
L07		L21		L35	
L08		L22		L36	
L09		L23		L37	
L10		L24		L38	
L11		L25		L39	
L12		L26		L40	
L13		L27		L41	
L14		L28			

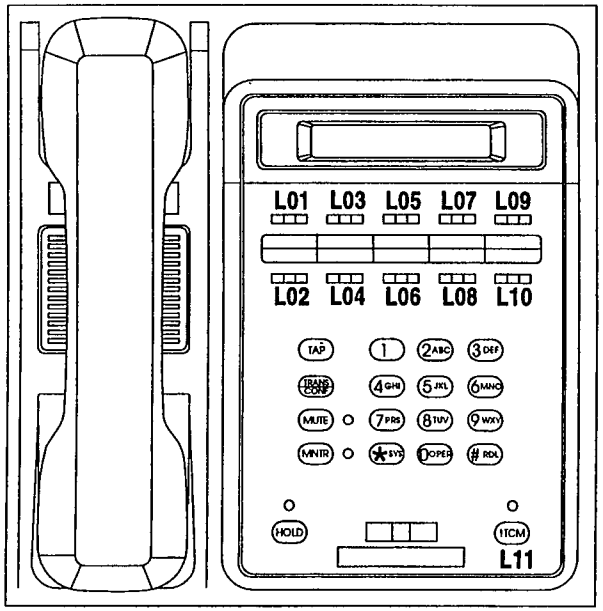
BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

CAJS068

Button Default For Station 101	
L01 = SHIFT	L14 = NIGHT
L02 = PAGE 1	L15 = ####
L03 = QUEUE	L16 = ####
L04 = PARK 4	L17 = ####
L05 = OVRFL	L18 = ####
L06 = PARK 3	L19 = ####
L07 = I3101	L20 = ####
L08 = PARK 2	L21 = ####
L09 = I3102	L22 = I101
L10 = PARK 1	L23 = ANSWR
L11 = I3103	L24 = RLSE
L12 = ALTRN	L25 = MSGWT
L13 = I3104	L26 - L41 = ####

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068A

10-Button Telephone

- ☐ LCD Speakerphone
- ☐ Speakerphone
- ☐ Monitor Telephone

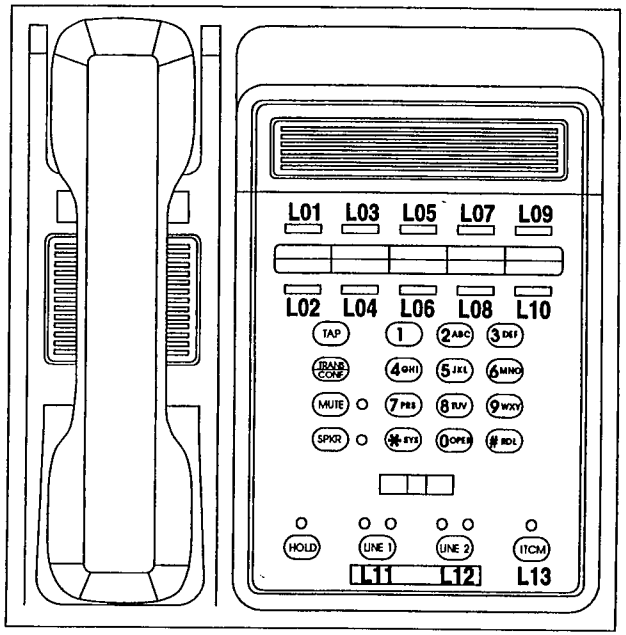
BUTTON ASSIGNMENT CHART			
L01		L07	
L02		L08	
L03		L09	
L04		L10	
L05		L11	
L06			

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101
L01 = SHIFT
L02 = PAGE 1
L03 = QUEUE
L04 = PARK 4
L05 = OVRFL
L06 = PARK 3
L07 = I3101
L08 = PARK 2
L09 = I3102
L10 = PARK 1
L11 = I101

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



2-Line Telephone

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

CAJS068C

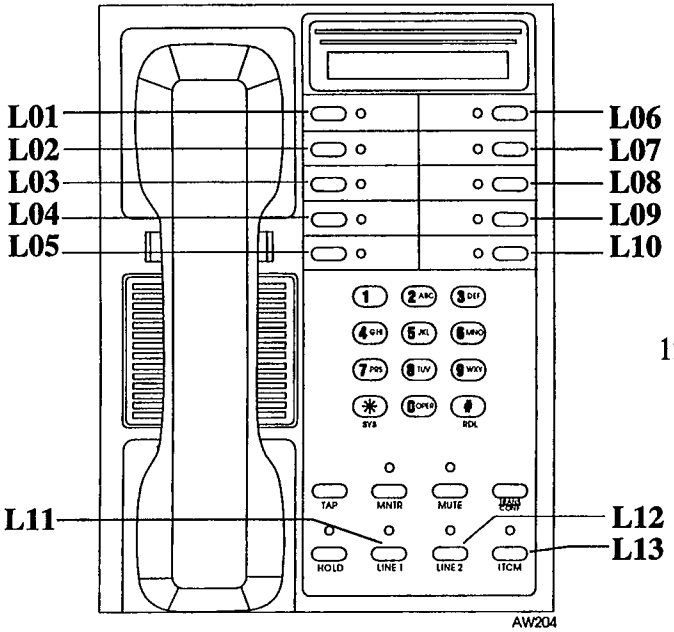
BUTTON ASSIGNMENT CHART			
L01		L08	
L02		L09	
L03		L10	
L04		L11	
L05		L12	
L06		L13	
L07			

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101
L01 = SHIFT
L02 = PAGE 1
L03 = QUEUE
L04 = PARK 4
L05 = OVRFL
L06 = PARK 3
L07 = I3101
L08 = PARK 2
L09 = I3102
L10 = PARK 1
L11 = ANSWR
L12 = RLSE
L13 = I101

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



12-Line LCD Speakerphone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068D

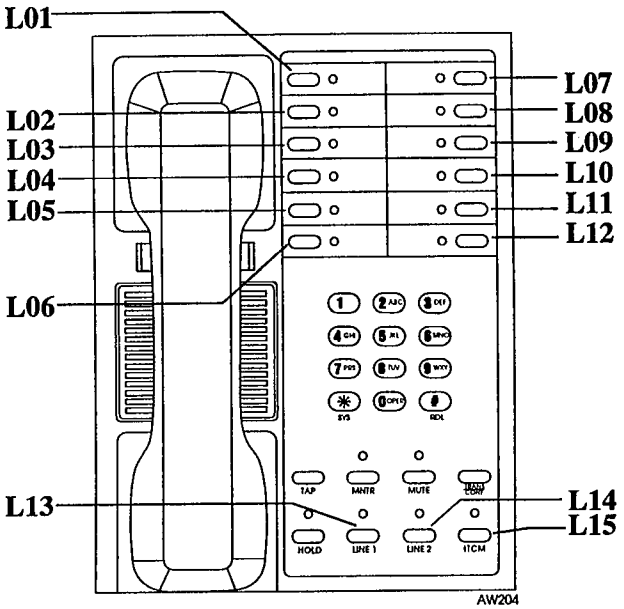
BUTTON ASSIGNMENT CHART			
L01		L08	
L02		L09	
L03		L10	
L04		L11	
L05		L12	
L06		L13	
L07			

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30,* = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, *=all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101
L01 = SHIFT
L02 = QUEUE
L03 = OVRFL
L04 = I3101
L05 = I3102
L06 = PAGE 1
L07 = PARK 4
L08 = PARK 3
L09 = PARK 2
L10 = PARK 1
L11 = ANSWR
L12 = RLSE
L13 = I101

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



14-Line Telephone
☐ Speakerphone
☐ Monitor Telephone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068E

BUTTON ASSIGNMENT CHART			
L01		L09	
L02		L10	
L03		L11	
L04		L12	
L05		L13	
L06		L14	
L07		L15	
L08			

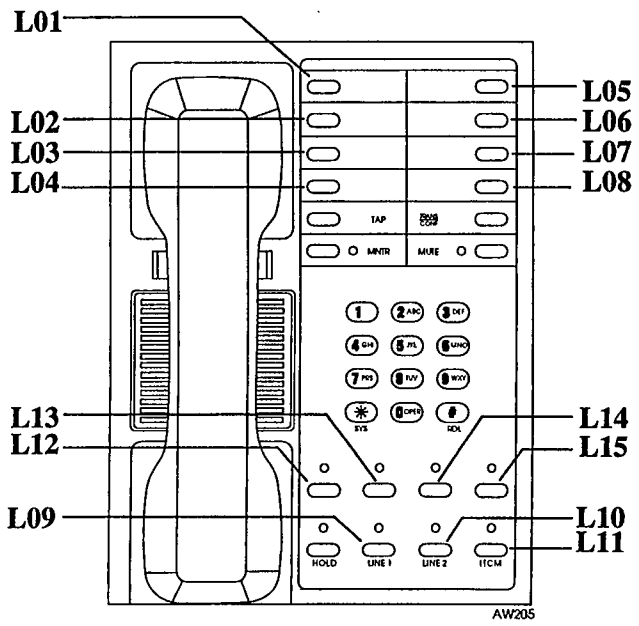
BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101
L01 = SHIFT
L02 = QUEUE
L03 = OVRFL
L04 = I3101
L05 = I3102
L06 = I3103
L07 = PAGE 1
L08 = PARK 4
L09 = PARK 3
L10 = PARK 2
L11 = PARK 1
L12 = ALTRN
L13 = ANSWR
L14 = RLSE
L15 = I101

3.3.9 ExecuTech 6-Line Telephone Mapping Record

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



6-Line Monitor Telephone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068F

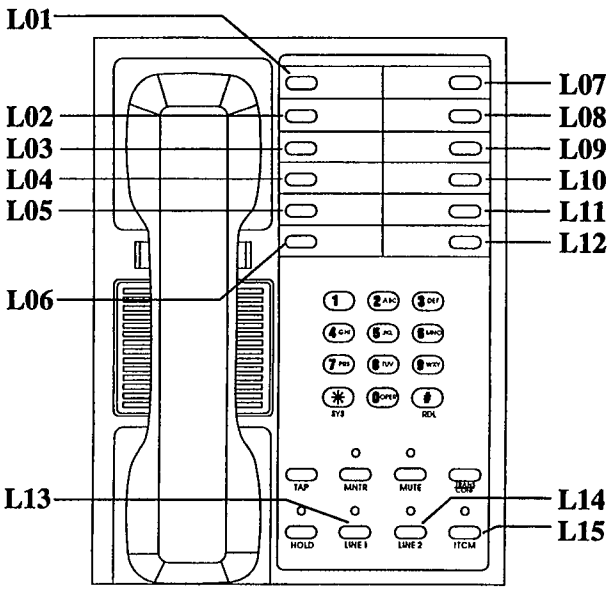
BUTTON ASSIGNMENT CHART			
L01		L09	
L02		L10	
L03		L11	
L04		L12	
L05		L13	
L06		L14	
L07		L15	
L08			

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30,* = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, *=all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101
L01 = SHIFT
L02 = QUEUE
L03 = OVRFL
L04 = I3101
L05 = PAGE 1
L06 = PARK 4
L07 = PARK 3
L08 = PARK 2
L09 = ANSWR
L10 = RLSE
L11 = I101
L12 = MSGWT
L13 = ###
L14 = ###
L15 = ###

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



2-Line Monitor Telephone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068G

BUTTON ASSIGNMENT CHART			
L01		L09	
L02		L10	
L03		L11	
L04		L12	
L05		L13	
L06		L14	
L07		L15	
L08			

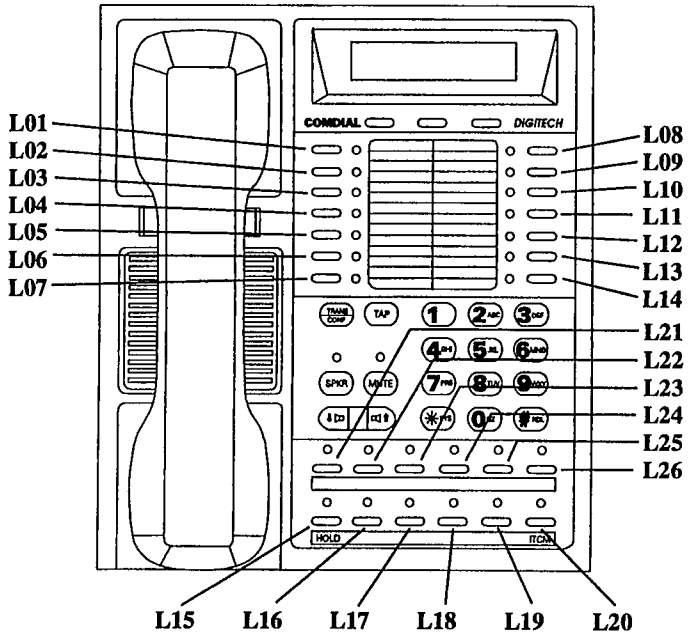
BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101
L01 = SHIFT
L02 = QUEUE
L03 = OVRFL
L04 = I3101
L05 = I3102
L06 = I3103
L07 = PAGE 1
L08 = PARK 4
L09 = PARK 3
L10 = PARK 2
L11 = PARK 1
L12 = ALTRN
L13 = ANSWR
L14 = RLSE
L15 = I101

3.3.11 DigiTech 24-Line LCD Speakerphone Mapping Record

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



24-Line LCD Speakerphone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068H

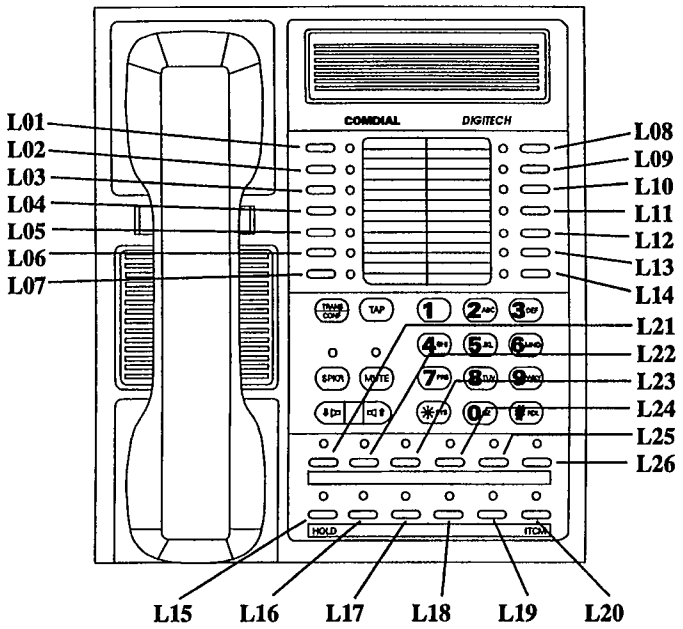
BUTTON ASSIGNMENT CHART					
L01		L10		L19	
L02		L11		L20	
L03		L12		L21	
L04		L13		L22	
L05		L14		L23	
L06		L15		L24	
L07		L16		L25	
L08		L17		L26	
L09		L18			

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101	
L01 = SHIFT	L14 = NIGHT
L02 = QUEUE	L15 = HOLD
L03 = OVRFL	L16 = ANSWR
L04 = I3101	L17 = RLSE
L05 = I3102	L18 = MSGWT
L06 = I3103	L19 = ###
L07 = I3104	L20 = I101
L08 = PAGE 1	L21 = ###
L09 = PARK 4	L22 = ###
L10 = PARK 3	L23 = ###
L11 = PARK 2	L24 = ###
L12 = PARK 1	L25 = ###
L13 = ALTRN	L26 = ###

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



24-Line Telephone

☐ Speakerphone

☐ Monitor Telephone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068I

BUTTON ASSIGNMENT CHART					
L01		L10		L19	
L02		L11		L20	
L03		L12		L21	
L04		L13		L22	
L05		L14		L23	
L06		L15		L24	
L07		L16		L25	
L08		L17		L26	
L09		L18			

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.

BUTTON	DESCRIPTION
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button

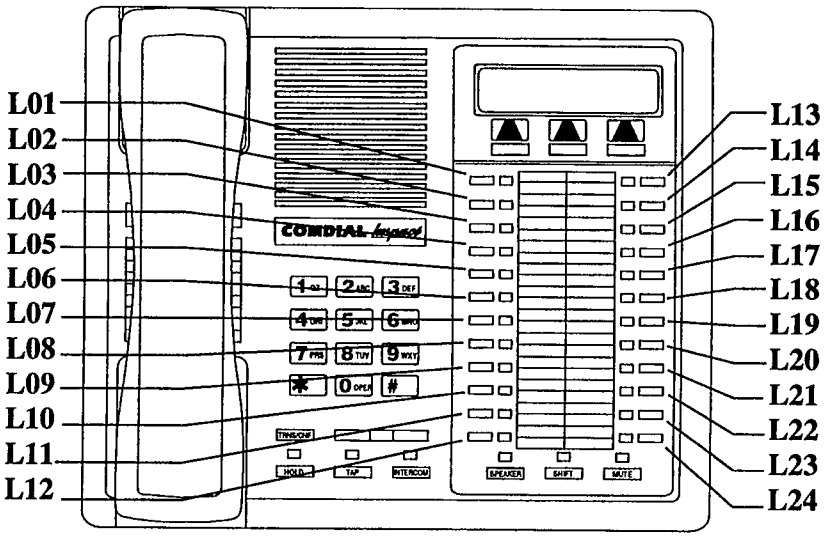
BUTTON	DESCRIPTION
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101	
L01 = SHIFT	L14 = NIGHT
L02 = QUEUE	L15 = HOLD
L03 = OVRFL	L16 = ANSWR
L04 = I3101	L17 = RLSE
L05 = I3102	L18 = MSGWT
L06 = I3103	L19 = ###
L07 = I3104	L20 = I101
L08 = PAGE 1	L21 = ###
L09 = PARK 4	L22 = ###
L10 = PARK 3	L23 = ###
L11 = PARK 2	L24 = ###
L12 = PARK 1	L25 = ###
L13 = ALTRN	L26 = ###

3.3.13 Impact 24-Line LCD Speakerphone Mapping Record

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



24-Line LCD Speakerphone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068J

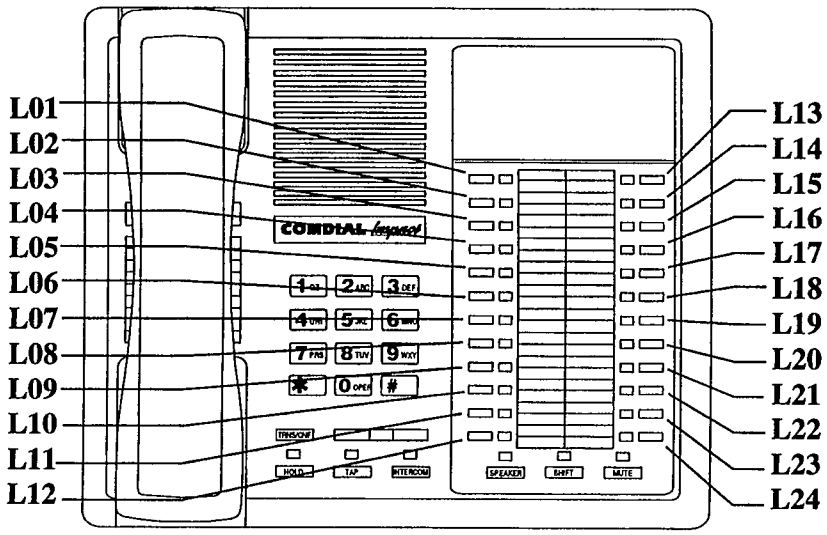
BUTTON ASSIGNMENT CHART					
L01		L09		L17	
L02		L10		L18	
L03		L11		L19	
L04		L12		L20	
L05		L13		L21	
L06		L14		L22	
L07		L15		L23	
L08		L16		L24	

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS_Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101	
L01 = SHIFT	L13 = PAGE 1
L02 = QUEUE	L14 = PARK 4
L03 = OVRFL	L15 = PARK 3
L04 = I3101	L16 = PARK 2
L05 = I3102	L17 = PARK 1
L06 = I3103	L18 = ALTRN
L07 = I3104	L19 = NIGHT
L08 = ###	L20 = ###
L09 = ANSWR	L21 = RLSE
L10 = MSGWT	L22 = ###
L11 = ###	L23 = ###
L12 = ###	L24 = ###

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



24-Line Speakerphone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068K

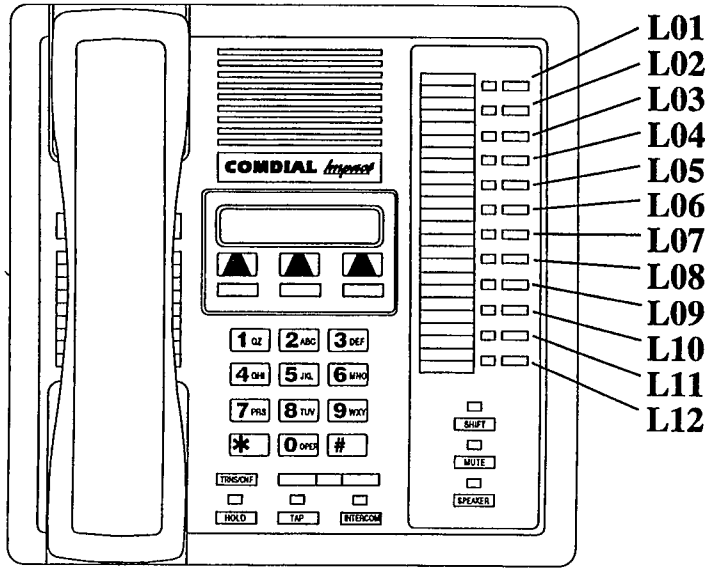
BUTTON ASSIGNMENT CHART					
L01		L09		L17	
L02		L10		L18	
L03		L11		L19	
L04		L12		L20	
L05		L13		L21	
L06		L14		L22	
L07		L15		L23	
L08		L16		L24	

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30,* = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, *=all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Button Default For Station 101	
L01 = SHIFT	L13 = PAGE 1
L02 = QUEUE	L14 = PARK 4
L03 = OVRFL	L15 = PARK 3
L04 = I3101	L16 = PARK 2
L05 = I3102	L17 = PARK 1
L06 = I3103	L18 = ALTRN
L07 = I3104	L19 = NIGHT
L08 = ###	L20 = ###
L09 = ANSWR	L21 = RLSE
L10 = MSGWT	L22 = ###
L11 = ###	L23 = ###
L12 = ###	L24 = ###

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



12-Line LCD Speakerphone

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

CAJS068L

BUTTON ASSIGNMENT CHART			
L01		L07	
L02		L08	
L03		L09	
L04		L10	
L05		L11	
L06		L12	

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

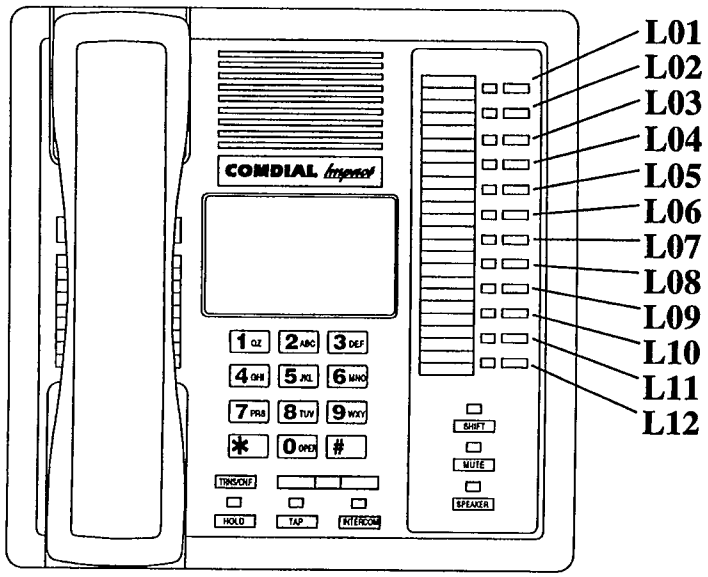
Button Default For Station 101
L01 = SHIFT
L02 = QUEUE
L03 = OVRFL
L04 = I3101
L05 = I3102
L06 = I3103
L07 = I3104
L08 = ###
L09 = ANSWR
L10 = MSGWT
L11 = ###
L12 = ###

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

CAJS068M



12-Line
Speakerphone

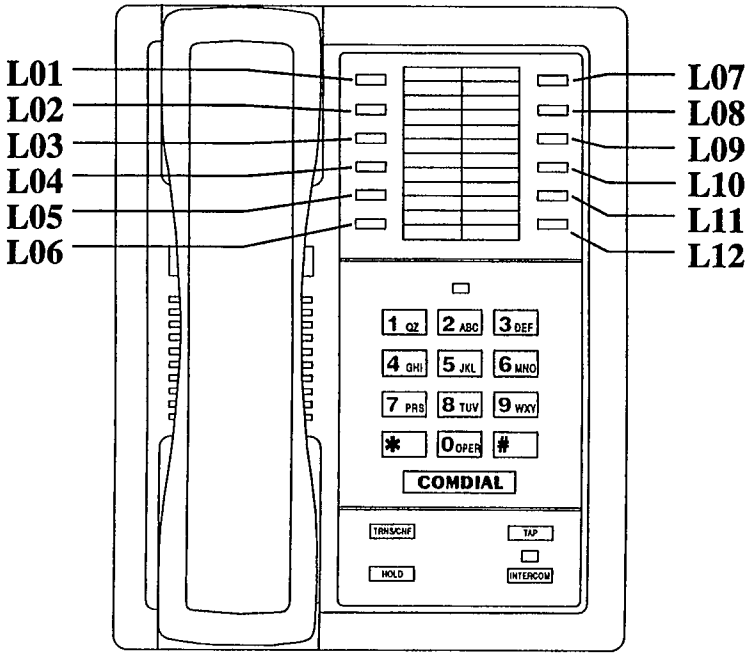
BUTTON ASSIGNMENT CHART			
L01		L07	
L02		L08	
L03		L09	
L04		L10	
L05		L11	
L06		L12	

Button Default For Station 101
L01 = SHIFT
L02 = NIGHT
L03 = ALTRN
L04 = PAGE 1
L05 = PARK 1
L06 = PARK 2
L07 = PARK 3
L08 = PARK 4
L09 = ANSWR
L10 = MSGWT
L11 = ###
L12 = ###

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN.	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD.	Auxiliary Record Btn.
ARING.	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP.	Directed Call Pick Up
DSTAT.	DSS Status Button
EXOVR	Executive Override
FEATR.	Feature Button
FWD-A.	Forward All Button
FWD-P.	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP.	Forward Personal RNA Btn.
GPLSN.	Group Listen Btn.
GPKUP.	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS.	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG.	Meet-Me Page Btn.
MSGWT.	Message Waiting Btn.
MUSC#.	Music Source (1, 2)
NIGHT.	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL.	Overflow Button
PAGE#.	Paging Zone Btn. 1-8
PARK#.	Park Orbit Button 1-9
PRVCY.	Privacy Button
QUEUE.	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA.	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST.	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY.	Line Test Busy Button
TRACK.	Tracker Pager Activate Button
VABLK.	Voice Announce Block Btn.
VOLSV.	Save Volume Button
XVM##.	Transfer To Voice Mail Btn. 1-32

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



12-Line Non-Monitor Telephone

PORT NUMBER			
INTERCOM NUMBER			
STATION NAME			
STATION LOCATION			
TELEPHONE	TYPE		
	MODEL		

CAJS068R

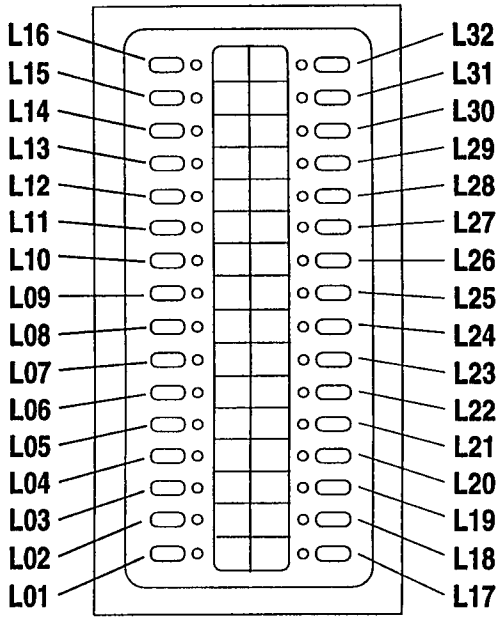
BUTTON ASSIGNMENT CHART			
L01		L07	
L02		L08	
L03		L09	
L04		L10	
L05		L11	
L06		L12	

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

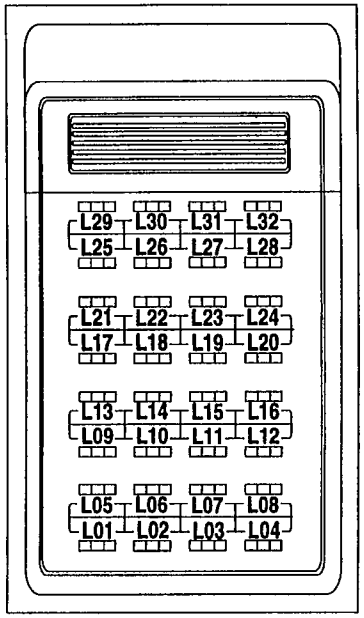
Button Default For Station 101
L01 = SHIFT
L02 = QUEUE
L03 = OVRFL
L04 = I3101
L05 = I3102
L06 = I3103
L07 = I3104
L08 = ###
L09 = ANSWR
L10 = MSGWT
L11 = ###
L12 = ###

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



32-Button DSS/BLF Console



PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

CAJS068N

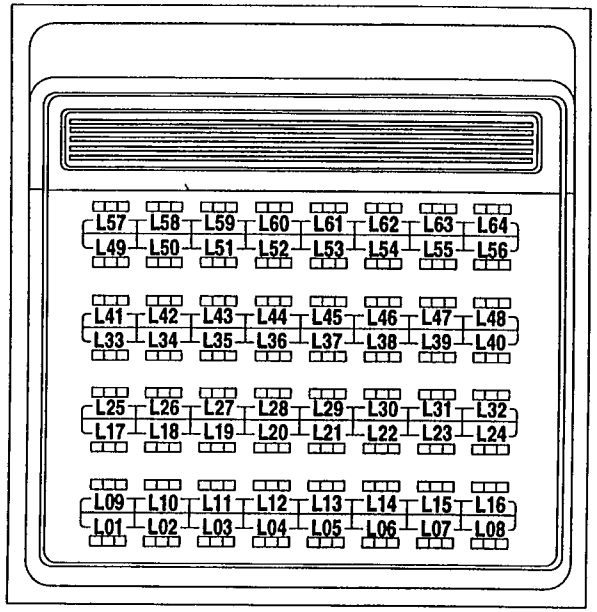
BUTTON ASSIGNMENT CHART			
L16		L32	
L15		L31	
L14		L30	
L13		L29	
L12		L28	
L11		L27	
L10		L26	
L09		L25	
L08		L24	
L07		L23	
L06		L22	
L05		L21	
L04		L20	
L03		L19	
L02		L18	
L01		L17	

Default: L01 - L64 = Blanked (Cleared of any assignment)

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



64-Button DSS/BLF Console

BUTTON ASSIGNMENT CHART							
L16		L32		L48		L64	
L15		L31		L47		L63	
L14		L30		L46		L62	
L13		L29		L45		L61	
L12		L28		L44		L60	
L11		L27		L43		L59	
L10		L26		L42		L58	
L09		L25		L41		L57	
L08		L24		L40		L56	
L07		L23		L39		L55	
L06		L22		L38		L54	
L05		L21		L37		L53	
L04		L20		L36		L52	
L03		L19		L35		L51	
L02		L18		L34		L50	
L01		L17		L33		L49	
Default: L01 - L64 = Blanked (Cleared of any assignment)							

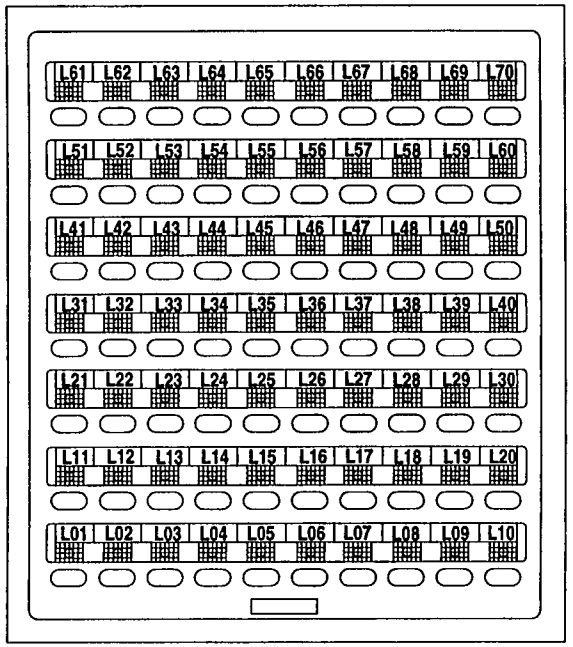
BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN.	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD.	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP.	Directed Call Pick Up
DSTAT.	DSS Status Button
EXOVR	Executive Override
FEATR.	Feature Button
FWD-A.	Forward All Button
FWD-P.	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP.	Forward Personal RNA Btn.
GPLSN.	Group Listen Btn.
GPKUP.	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS.	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT.	Message Waiting Btn.
MUSC#.	Music Source (1, 2)
NIGHT.	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL.	Overflow Button
PAGE#.	Paging Zone Btn. 1-8
PARK#.	Park Orbit Button 1-9
PRVCY.	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30,* = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST.	System Status Report Btn.
TAFS#	Night Answer Button 1-4, *=all calls
TBUSY.	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV.	Save Volume Button
XVM##.	Transfer To Voice Mail Btn. 1-32

CAJS068O

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



70-Button DSS/BLF Console

BUTTON ASSIGNMENT CHART									
L16		L32		L48		L64		L70	
L15		L31		L47		L63		L69	
L14		L30		L46		L62		L68	
L13		L29		L45		L61		L67	
L12		L28		L44		L60		L66	
L11		L27		L43		L59		L65	
L10		L26		L42		L58			
L09		L25		L41		L57			
L08		L24		L40		L56			
L07		L23		L39		L55			
L06		L22		L38		L54			
L05		L21		L37		L53			
L04		L20		L36		L52			
L03		L19		L35		L51			
L02		L18		L34		L50			
L01		L17		L33		L49			
Default: L01 - L70 = Blanked (Cleared of any assignment)									

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.

BUTTON	DESCRIPTION
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button

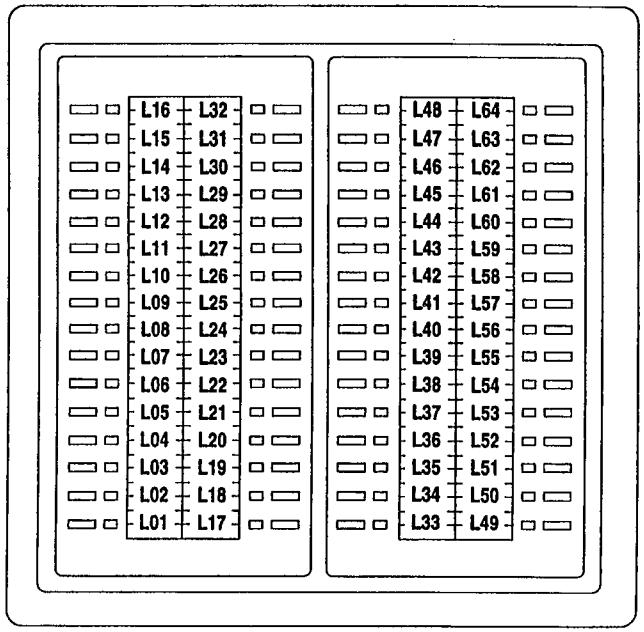
BUTTON	DESCRIPTION
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, *=all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

CAJS068Q

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



64-Button DSS/BLF Console

BUTTON ASSIGNMENT CHART							
L16		L32		L48		L64	
L15		L31		L47		L63	
L14		L30		L46		L62	
L13		L29		L45		L61	
L12		L28		L44		L60	
L11		L27		L43		L59	
L10		L26		L42		L58	
L09		L25		L41		L57	
L08		L24		L40		L56	
L07		L23		L39		L55	
L06		L22		L38		L54	
L05		L21		L37		L53	
L04		L20		L36		L52	
L03		L19		L35		L51	
L02		L18		L34		L50	
L01		L17		L33		L49	
Default: L01 - L64 = Blanked (Cleared of any assignment)							

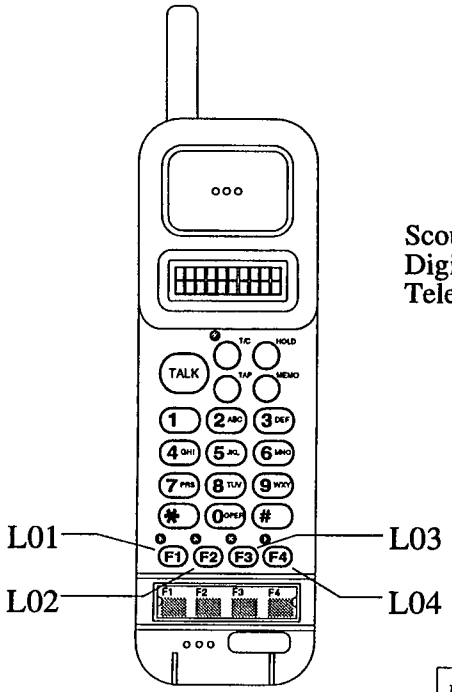
BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

CAJS068P

Station Button Mapping Record

(Complete one record sheet for each station. Copy this blank record sheet as required for additional stations.)



Scout 900mx
Digital Wireless
Telephone

BUTTON ASSIGNMENT CHART	
L01	
L02	
L03	
L04	
Default: L01 = Line 1, L02 = Line 3, L03 = Line 5 L04 = Intercom	

PORT NUMBER		
INTERCOM NUMBER		
STATION NAME		
STATION LOCATION		
TELEPHONE	TYPE	
	MODEL	

CAJS068X

BUTTON	DESCRIPTION
ACCT	Account Code Entry
ALTRN	Alternate Attendant Btn.
ANSWER	Answer Button
APAGE	Auxiliary Page Btn.
ARD	Auto Redial Button
ARECD	Auxiliary Record Btn.
ARING	Auxiliary Ring Button
AUTH	Authorization Code Btn.
BOTH	Both Button
CAMP	Camp On Button
CID	Caller ID Button
DND	Do Not Disturb Button
DPKUP	Directed Call Pick Up
DSTAT	DSS Status Button
EXOVR	Executive Override
FEATR	Feature Button
FWD-A	Forward All Button
FWD-P	Forward Personal
FWDRA	Forward All RNA Btn.
FWDRP	Forward Personal RNA Btn.
GPLSN	Group Listen Btn.
GPKUP	Group Pick Up Btn.
HDST	Headset Mode
HOLD	Hold Button
ITCM	Intercom Button
I####	Intercom Number Btn.
LCDMS	LCD Messaging Btn.
LNG##	Line Group Btn. 1-16
LN###	Line Button 1-128
LOCK	Lock Button
MMEPG	Meet-Me Page Btn.
MSGWT	Message Waiting Btn.
MUSC#	Music Source (1, 2)
NIGHT	Night Mode Button
OAI##	Open Architecture Btn.
OVERFL	Overflow Button
PAGE#	Paging Zone Btn. 1-8
PARK#	Park Orbit Button 1-9
PRVCY	Privacy Button
QUEUE	Queue Button
RLSE	Release Button
RSP##	Response Button 1-30, * = universal
S-OBS	Service Observe Button
SAVE	Dynamic Save Button
SDIAL	Speed Dial
SILNT	Silent Ringer Button
SOHVA	SOHVA Button
SPLIT	Split Button
SRIAL	Serial Call Button
SYSST	System Status Report Btn.
TAFS#	Night Answer Button 1-4, * =all calls
TBUSY	Line Test Busy Button
TRACK	Tracker Pager Activate Button
VABLK	Voice Announce Block Btn.
VOLSV	Save Volume Button
XVM##	Transfer To Voice Mail Btn. 1-32

3.4 *Copy Model COS (Block Programming Record For Class Of Service)*

Model Class Of Service	Matching Class Of Service

3.5 *Copy Model Station (Block Programming Record For Stations)*

Copy this chart as needed for each station board.

Model Station (Intercom Number or Name)	Matching Stations

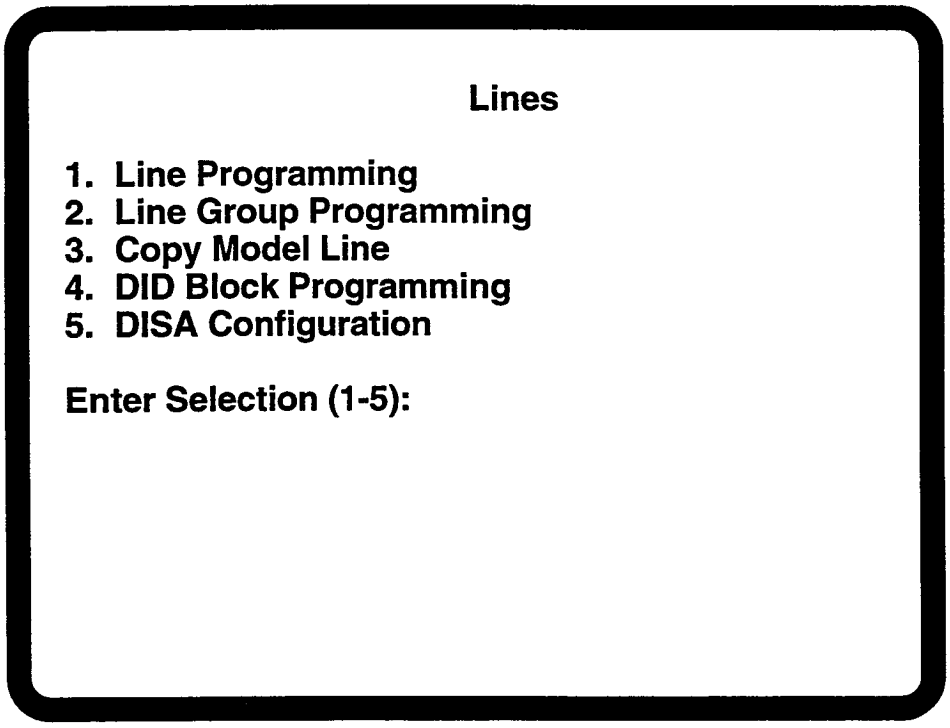
3.6 *Copy Button Map (Block Programming Record For Button Mapping)*

Copy this chart as needed for each station board.

Model Station (Intercom Number or Name)	Matching Stations

4 Line Records

- From the main menu, type selection number for line menu and press **ENTER**.
- From the line menu, type selection number for feature and press **ENTER**.



4.1 Line Programming

4.1.1 AUX And Loop Start Line Types

(Complete one record sheet for each line. Copy this blank sheet as needed to provide a record for each line in the system.)

Line Port_____

Dialing Code (if applicable)_____

Name_____

☐ AUX (Auxiliary)

☐ Loop Start Line

Feature	Setting*								Default
Disabled	Yes				No				*No*
Music Or Tone On Hold	Tone		Source 1		Source 2		None		*Source 1*
Ringback On Transfer	Yes				No				*No*
Privacy Release	Yes				No				*No*
SMDR Record	Yes				No				*Yes*
Cost Incoming	Yes				No				*No*
Incoming Cost Delay	No Delay	6 sec.	12 sec.	18 sec.	24 sec.	30 sec.	36 sec.	On Ans.	*No Delay*
Incoming Cost Route	1–32								*32*
Pad Level Transmit	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level Receive	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level–DISA	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Gain 1*
Dialing Mode	Tone				Pulse				*Tone*
Abandon Hold Release	50 msec.				350 msec.				*350 msec.*
Positive Disconnect Time	400 msec.			500 msec.			800 msec.		*2 sec.*
	1 sec.	1.6 sec		2 sec.	3 sec.	4 sec.	5 sec.		
Toll Groups	0 32								*1*
DTMF Level	Low		High		Normal				*Normal*
Busy Lead	Yes				No				*No*
Disconnect Supervision	Yes				No				*No*
Caller ID Active	Yes				No				*No*
Voice Mail ID	None 8 digits								*None*
DISA	Yes				No				*No*
DISA Voice Options	1–4								*1*

*Mark block to match desired setting

NOTE: DISA is not recommended for loop start line configurations.

Record The Group Assignment For This Line (0-16)															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

4.1.2 Ground Start Line Type

(Complete one record sheet for each line. Copy this blank sheet as needed to provide a record for each line in the system.)

Line Port_____

Dialing Code (if applicable)_____

Name_____

Feature	Setting*								Default
Disabled	Yes				No				*No*
Music Or Tone On Hold	Tone		Source 1		Source 2		None		*Source 1*
Ringback On Transfer	Yes				No				*No*
Privacy Release	Yes				No				*No*
SMDR Record	Yes				No				*Yes*
Cost Incoming	Yes				No				*No*
Incoming Cost Delay	No Delay	6 sec.	12 sec.	18 sec.	24 sec.	30 sec.	36 sec.	On Ans.	*No Delay*
Incoming Cost Route	1 32								*32*
Pad Level Transmit	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level Receive	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level–DISA	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Incoming Alert Signal	Ring Required				Ring Optional				*Ring Req.*
Dialing Mode	Tone				Pulse				*Tone*
Toll Groups	0 32								*1*
DTMF Level	Low		High		Normal				*Normal*
Busy Lead	Yes				No				*No*
Caller ID Active	Yes				No				*No*
Voice Mail	None 8 digits								
DISA	Yes								*No*
DISA Voice Options	1 4								*1*

*Mark block to match desired setting

Record The Group Assignment For This Line (0-16)															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

4.1.3 E & M Tie Line Type

(Complete one record sheet for each line. Copy this blank sheet as needed to provide a record for each line in the system.)

Line Port_____

Dialing Code (if applicable)_____

Name_____

Feature	Setting*								Default
Disabled	Yes				No				*No*
Music Or Tone On Hold	Tone		Source 1		Source 2		None		*Source 1*
Ringback On Tansfer	Yes				No				*No*
Privacy Release	Yes				No				*No*
SMDR Record	Yes				No				*Yes*
Cost Incoming	Yes				No				*No*
Incoming Cost Delay	No Delay	6 sec.	12 sec.	18 sec.	24 sec.	30 sec.	36 sec.	On Ans.	*No Delay*
Incoming Cost Route	1–32								*32*
Pad Level Transmit	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level Receive	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Connect Mode	Direct (Metalic)				Carrier (Central Office)				*Direct*
Control Signalling	Delay Start			Immediate Start			Wink Start		*Wink*
Line Access Hot Line Extension	Hot Line		Ext. #		Dialing				*Dialing*
ANI Delivery	Yes				No				*No*
Call Announce Active	Yes				No				*No*
Dialing Mode	Tone				Pulse				*Tone*
Toll Groups	0 32								*1*
DTMF Level	Low		High		Normal				*Normal*
DISA	Yes				No				*No*
DISA Voice Options	1 4								*1*

*Mark block to match desired setting

Record The Group Assignment For This Line (0-16)															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

4.1.4 DID Line Types

(Complete one record sheet for each line. Copy this blank sheet as needed to provide a record for each line in the system.)

Line Port_____

Dialing Code (if applicable)_____

Name_____

Feature	Setting*								Default
Disabled	Yes				No				*No*
Music Or Tone On Hold	Tone		Source 1		Source 2		None		*Source 1*
Ringback On Transfer	Yes				No				*No*
Privacy Release	Yes				No				*No*
SMDR Record	Yes				No				*Yes*
Cost Incoming	Yes				No				*No*
Incoming Cost Delay	No Delay	6 sec.	12 sec.	18 sec.	24 sec.	30 sec.	36 sec.	On Ans.	*No Delay*
Incoming Cost Route	1 32								*32*
Pad Level Transmit	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level Receive	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level–DISA	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
DID/DINS Block	1–4								*1*

*Mark block to match desired setting

Record The Group Assignment For This Line (0-16)															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

4.1.5 E & M DNIS Line Types

(Complete one record sheet for each line. Copy this blank sheet as needed to provide a record for each line in the system.)

Line Port_____

Dialing Code (if applicable)_____

Name_____

Feature	Setting*								Default
Disabled	Yes				No				*No*
Music Or Tone On Hold	Tone		Source 1		Source 2		None		*Source 1*
Ringback On Transfer	Yes				No				*No*
Privacy Release	Yes				No				*No*
SMDR Record	Yes				No				*Yes*
Cost Incoming	Yes				No				*No*
Incoming Cost Delay	No Delay	6 sec.	12 sec.	18 sec.	24 sec.	30 sec.	36 sec.	On Ans.	*No Delay*
Incoming Cost Route	1–32								*32*
Pad Level Transmit	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level Receive	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
Pad Level–DISA	Gain 2	Gain 1	Nom.	Loss 1	Loss 2	Loss 3	Loss 4	Loss 5	*Nominal*
DID/DINS Block	1–4								*1*
Call Announce Active	Yes				No				*No*
Toll Groups	1–32								*1*

*Mark block to match desired setting

Record The Group Assignment For This Line (0-16)															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

4.2 Line Group Programming

Group	Group Name	Line Assigned
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

Default: Group 1 = lines 9–16, Group 2 = lines 17–21, Group 3 = lines 25–32, Groups 4–16 = no lines assigned

4.3 Block Programming Record For Lines

Model Line	Matching Lines

4.4 System Line Record

Bd. Type*	Port	Number	Name	Grp.
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20			
	21			
	22			
	23			
	24			
	25			
	26			
	27			
	28			
	29			
	30			
	31			
	32			
	33			
	34			
	35			
	36			
	37			
	38			
	39			
	40			
	41			
	42			
	43			
	44			
	45			
	46			
	47			
	48			
	49			
	50			
	51			
	52			
	53			
	54			
	55			
	56			
	57			
	58			
	59			
	60			
	61			
	62			
	63			
	64			

Bd. Type*	Port	Number	Name	Grp.
	65			
	66			
	67			
	68			
	69			
	70			
	71			
	72			
	73			
	74			
	75			
	76			
	77			
	78			
	79			
	80			
	81			
	82			
	83			
	84			
	85			
	86			
	87			
	88			
	89			
	90			
	91			
	92			
	93			
	94			
	95			
	96			
	97			
	98			
	99			
	100			
	101			
	102			
	103			
	104			
	105			
	106			
	107			
	108			
	109			
	110			
	111			
	112			
	113			
	114			
	115			
	116			
	117			
	118			
	119			
	120			
	121			
	122			
	123			
	124			
	125			
	126			
	127			
	128			

*Enter either DXPCO-LP4 or DXPCO-LP8 for board type

4.5 DID/DNIS Block Programming

4.5.1 DID/DNIS Options

Feature	Choice			Default
Option Block Number (1–4)				—
Block Name (7 char. max.)				—
Control Signalling	Wink Start	Immediate Start	Delay Start	*Wink*
Expected CO Digits	0–7			*7*
Dialing Mode	Tone	Pulse		*Tone*
ANI Delivery	Yes	No		*No*
DISA Voice Options	1–4			*1*
Alternate Routing—Extension	0, nnnn			—
Alternate Routing—Ring Code	1–8			*1*
* Mark each block to match your desired setting.				

Feature	Choice			Default
Option Block Number (1–4)				—
Block Name (7 char. max.)				—
Control Signalling	Wink Start	Immediate Start	Delay Start	*Wink*
Expected CO Digits	0–7			*7*
Dialing Mode	Tone	Pulse		*Tone*
ANI Delivery	Yes	No		*No*
DISA Voice Options	1–4			*1*
Alternate Routing—Extension	0, nnnn			—
Alternate Routing—Ring Code	1–8			*1*
* Mark each block to match your desired setting.				

Feature	Choice			Default
Option Block Number (1–4)				—
Block Name (7 char. max.)				—
Control Signalling	Wink Start	Immediate Start	Delay Start	*Wink*
Expected CO Digits	0–7			*7*
Dialing Mode	Tone	Pulse		*Tone*
ANI Delivery	Yes	No		*No*
DISA Voice Options	1–4			*1*
Alternate Routing—Extension	0, nnnn			—
Alternate Routing—Ring Code	1–8			*1*
* Mark each block to match your desired setting.				

Feature	Choice			Default
Option Block Number (1–4)				—
Block Name (7 char. max.)				—
Control Signalling	Wink Start	Immediate Start	Delay Start	*Wink*
Expected CO Digits	0–7			*7*
Dialing Mode	Tone	Pulse		*Tone*
ANI Delivery	Yes	No		*No*
DISA Voice Options	1–4			*1*
Alternate Routing—Extension	0, nnnn			—
Alternate Routing—Ring Code	1–8			*1*
* Mark each block to match your desired setting.				

4.5.2 DID/DINS Translation Table

(Complete one record sheet for each DID block. Copy this blank sheet as needed to provide a record for every CO digit sequence.)

DID Block_____

CO Digits	Name	Day Itcm. Number	Night Itcm. Number	Ring Code*

4.6 DISA Configuration Programming

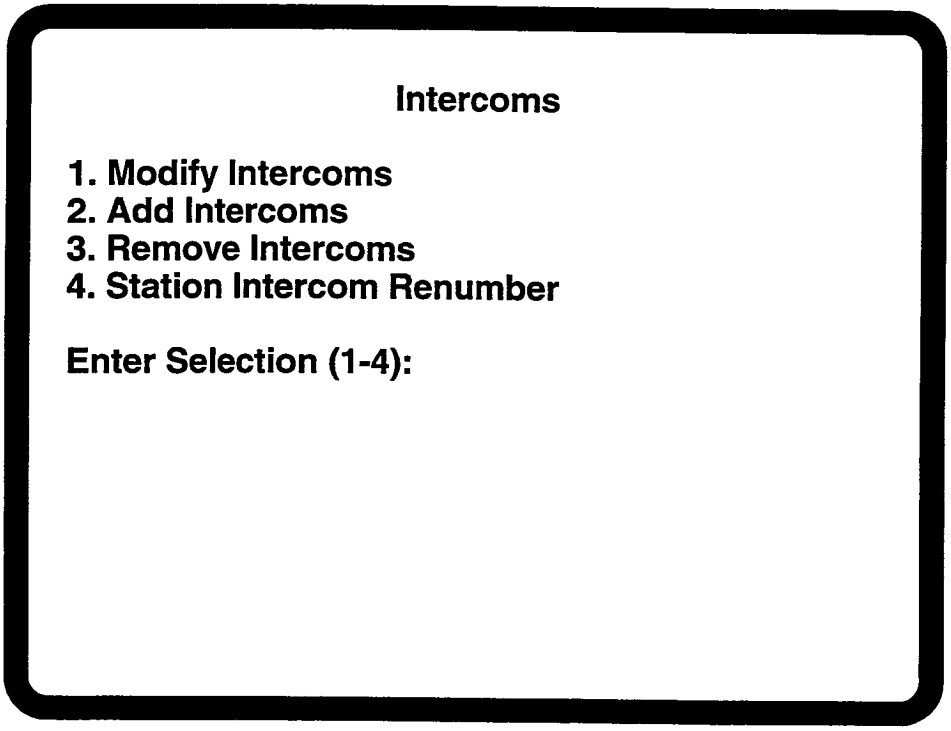
Use the table below for recording DISA configuration parameters.

Feature	Setting	Default
Day Routing Extension		
Night Routing Extension		
Voice Mail Routing ID		
Lockout Time: 2, 5, 10, 15, or 30 minutes.		***10 minutes***
RNA Timeout: 0 through 9 rings (see note below table).		***3 rings***
Maximum Reminder Timeout: 2, 5, 10, 15, or 30 minutes.		***10 minutes***
Route/Drop Invalid Access		***Drop***

NOTE: The RNA timeout (number of rings with no answer) you select here must be less than the RNA rings that you select on the station programming record (Section 3.2).

5 Intercom Numbers

- From the main menu, type selection number for intercom numbers and press **ENTER**.
- From the intercom numbers menu, type selection number for feature and press **ENTER**.



5.1 Intercom Record

Bd. Type*	Port	Number		Name	COS
		Df'lt	As'gn		
	1	101			
	2	102			
	3	103			
	4	104			
	5	105			
	6	106			
	7	107			
	8	108			
	9	109			
	10	110			
	11	111			
	12	112			
	13	113			
	14	114			
	15	115			
	16	116			
	17	117			
	18	118			
	19	119			
	20	120			
	21	121			
	22	122			
	23	123			
	24	124			
	25	125			
	26	126			
	27	127			
	28	128			
	29	129			
	30	130			
	31	131			
	32	132			
	33	133			
	34	134			
	35	135			
	36	136			
	37	137			
	38	138			
	39	139			
	40	140			
	41	141			
	42	142			
	43	143			
	44	144			
	45	145			
	46	146			
	47	147			
	48	148			
	49	149			
	50	150			
	51	151			
	52	152			
	53	153			
	54	154			
	55	155			
	56	156			
	57	157			
	58	158			
	59	159			
	60	160			
	61	161			
	62	162			
	63	163			
	64	164			

*Enter: DXDST-8, DXDST-16, DXAST-8, DXAST-16
DXIST-8, or DXIST-16

Bd. Type*	Port	Number		Name	COS
		Df'lt	As'gn		
	65	165			
	66	166			
	67	167			
	68	168			
	69	169			
	70	170			
	71	171			
	72	172			
	73	173			
	74	174			
	75	175			
	76	176			
	77	177			
	78	178			
	79	179			
	80	180			
	81	181			
	82	182			
	83	183			
	84	184			
	85	185			
	86	186			
	87	187			
	88	188			
	89	189			
	90	190			
	91	191			
	92	192			
	93	193			
	94	194			
	95	195			
	96	196			
	97	197			
	98	198			
	99	199			
	100	200			
	101	201			
	102	202			
	103	203			
	104	204			
	105	205			
	106	206			
	107	207			
	108	208			
	109	209			
	110	210			
	111	211			
	112	212			
	113	213			
	114	214			
	115	215			
	116	216			
	117	217			
	118	218			
	119	219			
	120	220			
	121	221			
	122	222			
	123	223			
	124	224			
	125	225			
	126	226			
	127	227			
	128	228			

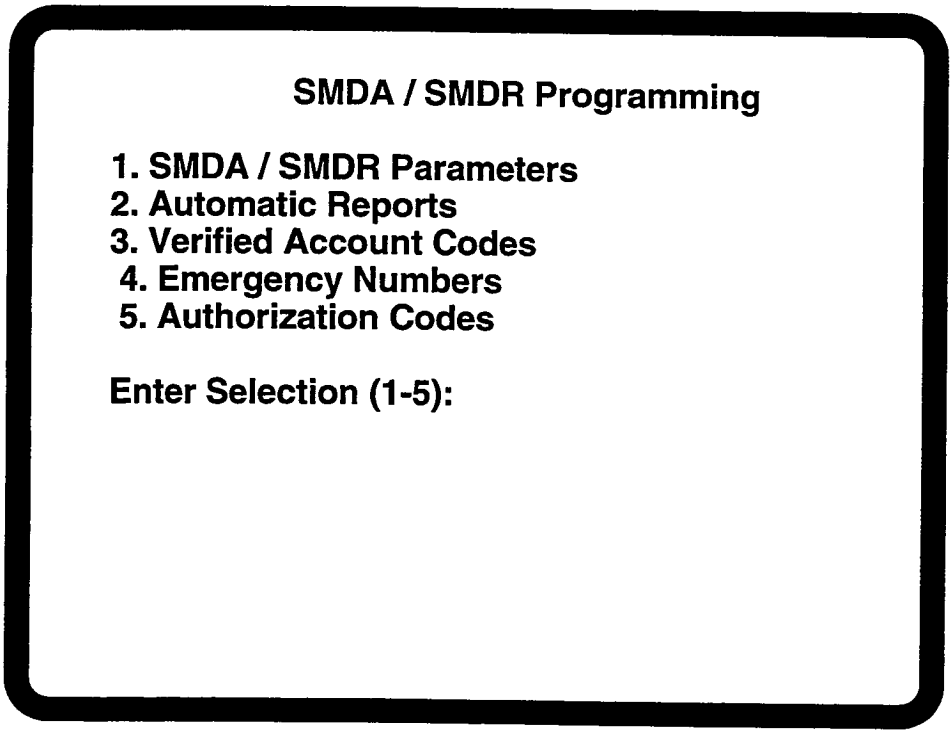
*Enter: DXDST-8, DXDST-16, DXAST-8, DXAST-16
DXIST-8, or DXIST-16

BD. TYPE*	PORT	NUMBER DF'LT	NUMBER AS'GN	NAME	COS
	129	229			
	130	230			
	131	231			
	132	232			
	133	233			
	134	234			
	135	235			
	136	236			
	137	237			
	138	238			
	139	239			
	140	241			
	142	242			
	143	243			
	144	244			
	145	245			
	146	246			
	147	247			
	148	248			
	149	249			
	150	250			
	151	251			
	152	252			
	153	253			
	154	254			
	155	255			
	156	256			
	157	257			
	158	258			
	159	259			
	160	260			
	161	261			
	162	262			
	163	263			
	164	264			
	165	265			
	166	256			
	167	267			
	168	268			
	169	269			
	170	270			
	171	271			
	172	272			
	173	273			
	174	274			
	175	275			
	176	276			
	177	277			
	178	278			
	179	279			
	180	280			
	181	281			
	182	282			
	183	283			
	184	284			
	185	285			
	186	286			
	187	287			
	188	288			
	189	289			
	190	290			
	191	291			
	192	292			

*Enter: DXDST-8, DXDST-16, DXAST-8, DXAST-16

6 SMDA/SMDR Records

- From the main menu, type selection number for SMDA/SMDR menu and press **ENTER**.
- From the SMDA/SMDR menu, type selection number for feature and press **ENTER**.



6.1 SMDA / SMDR Parameter Records

Feature	Default	Choice					
Dial Time Limit	*0 s*	6s	12s	18s	24s	30s	36s
	42s	1m	1.5m	2m	2.5m	3m	3.5m
Answer Time Limit	*0 s*	6s	12s	18s	24s	30s	36s
	42s	1s	1.5m	2m	2.5m	3m	3.5m
SMDR Print Parameter	*Costing*	No Costing	No print				
SMDR Record Format	*Standard*	SMDA Format					
Account Codes	*No Account Code*	Verify	No Verify				
Account Code Display	*No Display*	Incoming	Outgoing	In/Out			
Account Code Display Time	*2s*	4s	6s	8s	10s	12s	
	14s	16s	18 Sec				
Account Code Length	*3*	4	5	6	7	8	
Secure Account Code Display	*No*	Yes					
SMDA Attendent Delete	*Yes*	No					
SMDA/SMDR Printer Port	*1*	2					
Report Option	*Call Cost*	Call Cost	Hold time				

Mark blocks for desired programming choices.

6.2 Automatic Reports*

Report Print Day	***None***	Daily	Monday through Sunday	
Report Print Time	24-Hr. Format -	hh:mm	***00:00***	
Station Report	No Report	***Detail***	Summary	Detail/Summary
Account Report	No Report	***Detail***	Summary	Detail/Summary
Line Report	No Report	***Detail***	Summary	Detail/Summary
Print All Records	Yes	***No***		
Delete After Print	Yes	***No***		

****Defaults = values shown in bold italic type.***

Make blocks for desired programming choices or write information where appropriate.

6.3 Verified Account Codes

Account Code Length* (3—16 digits) _____

Account Code Record* (up 1000 entries allowed—copy this chart as needed)

Active Number	Active Number	Active Number	Active Number	Active Number

6.4 Emergency Numbers

1	*911*
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

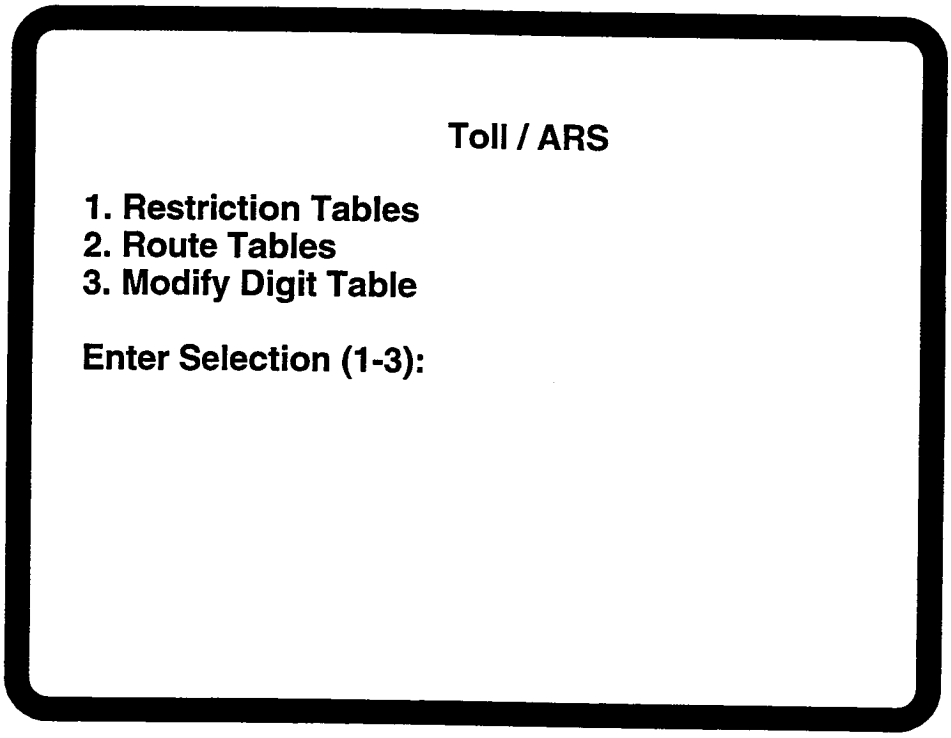
Enter 1—16 digits. ***Default = bold italic entry.***

6.5 Authorization Codes

Itcm No.	Code	Itcm. No.	Code	Itcm. No.	Code	Itcm. No.	Code

7 TOLL/ARS Records

- From the main menu, type selection number for TOLL/ARS and press **ENTER**.
- From the TOLL/ARS menu, type selection number for feature and press **ENTER**.



7.1 Restriction Tables

The system allows a total of 400 entries. Copy this sheet as needed to provide additional record space.

Dialed Number	Restriction Level	Exception Number	Route/Costing Table*	Toll Group
0	*2*	*1*	*1*	*1*
1@	*2*	*2*	*1*	*1*
@	*2*	*3*	*1*	*1*

*The Route/Costing Table records are not needed unless you program call costing or ARS for the system.

Default = bold italic entries

7.2 Station Restriction Level

Restriction Level level	Class Of Service	Toll Category	Stations Assigned
Allow All			
8			
7			
6			
5			
4			
3			
2			
1			
Deny All			

7.3 Toll Groups

Toll Groups	Lines Assigned To Each Toll Group
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	

7.4 Route Tables

ROUTE TABLE 1 (Route 1 defaults shown in bold italic print.)						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)	***16***					
ACCESS LEVEL (1-4)	***1***					
MODIFY DIGIT TABLE (1-16)	***1***					
SURCHARGE ($nn.nn)	***0.00***					
TIER 1 COST ($nn.nn)	***0.00***					
TIER 1 TIME (sec)	***0 sec***					
TIER 2 COST ($nn.nn)	***0.00***					
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE	*x*					
NOT ACTIVE						

ROUTE TABLE 2						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 3						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 4						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						

ROUTE TABLE 5						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 6						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 7						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 8						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 9						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 10						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 11						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 12						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 13						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 14						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 15						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 16						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 17						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 18						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 19						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 20						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 21						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 22						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 23						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 24						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 25						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 26						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 27						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 28						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 29						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 30						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 31						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

ROUTE TABLE 32						
SPECIFICATION	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6
LINE GROUP (1-16)						
ACCESS LEVEL (1-4)						
MODIFY DIGIT TABLE (1-16)						
SURCHARGE ($nn.nn)						
TIER 1 COST ($nn.nn)						
TIER 1 TIME (sec)						
TIER 2 COST ($nn.nn)						
ACTIVE WITH TONE						
ACTIVE WITHOUT TONE						
NOT ACTIVE						

7.5 Modify Digit Tables

MODIFY DIGITS TABLE 1																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 2																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 3																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 4																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 5																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 6																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 7																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 8																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 9																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 10																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 11																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 12																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 13																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 14																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 15																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

MODIFY DIGITS TABLE 16																				
NUMBER SEQUENCE OF ADDED DIGITS (0-20)																				
QUANTITY OF DELETED DIGITS (0-10)																				

8 Printout Records

- From main menu, type selection number for printouts menu and press **ENTER**.
- From printouts menu, type selection number for feature and press **ENTER**.

Printouts

1. System
2. Station
3. Lines
4. Intercom Number
5. SMDA/SMDR
6. Toll/ARS
7. Complete System Data
8. Abort Printouts

Enter Selection (1-8):

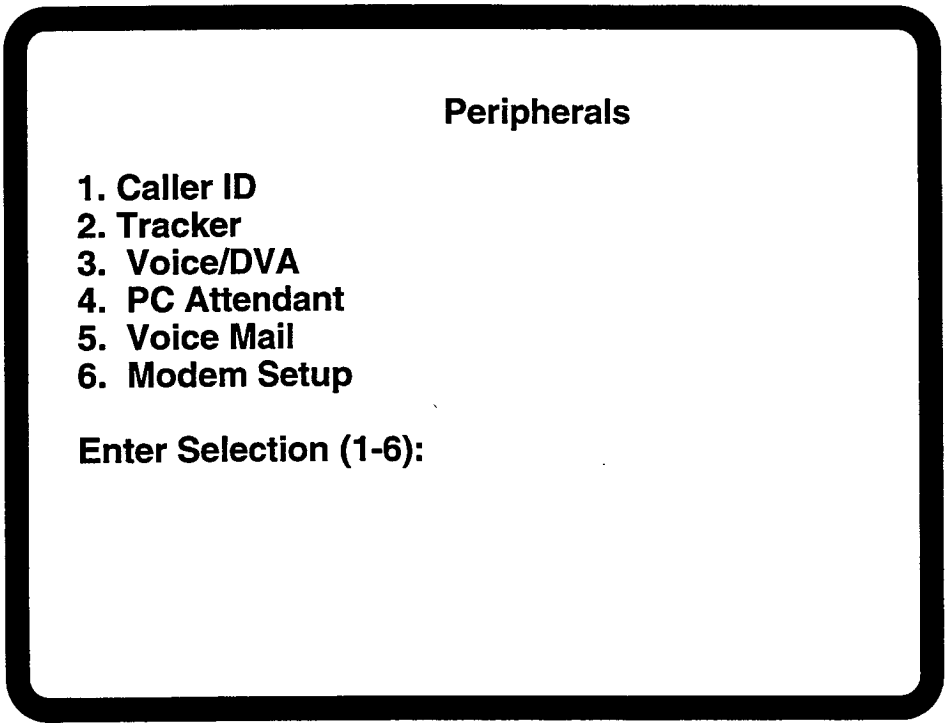
8.1 Printout Records

Record desired printouts.

System	
Station	
Lines	
Intercom Numbers	
Ext/Name	
Group Itcm.	
SMDA/SMDR	
Toll/ARS	
Complete System Data	

9 Peripherals

- From main menu, type selection number for desired peripheral menu and press **ENTER**.
- From selected peripheral menu, type selection number for feature and press **ENTER**.



9.1 Caller ID Records

9.1.1 Caller ID Options

Delete Viewed Records		*Yes*				No			
Abort Ring Time	0	1	2	3	*4*	5	6	7	8

Mark blocks to indicate programming choices.

Default = bold italic entries.

9.1.2 Caller ID Local Call Table

Row	Number

9.2 Tracker Records

9.2.1 Tracker Options

Tracker Base Station	Serial Data Port (1—18)	Remote Installation					Status	
		None	PC Attendant				Enabled	Disabled
			1	2	3	4		
1								
2								
3								
4								
Defaults: Serial Port =1, Remote Installation = None, Status = Disabled								

9.2.2 Tracker Pager Assignment *(Copy This Chart As Needed For Additional Record Space)*

Station		Pager Number	Enable		Tracker Pager Model				Tracker Base Station			
Intercom	Name		Yes	No	P1000	P2000	P3000	P4000	1	2	3	4

9.3 Voice/DVA Records

9.3.1 Voice Digit Translation *(Copy This Chart As Needed For Additional Voice Messages)*

DVA Voice Option Number_____

Message Type	Prompt Digit	Extension Number
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	0	
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	0	
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	0	
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	0	
Default = None Assigned		

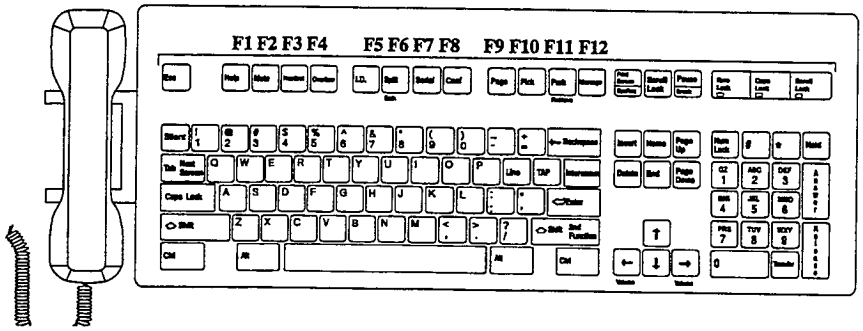
9.4 PC Attendant

9.4.1 Position Record

Feature	PC Attendant Position							
	Attendant Position 1		Attendant Position 2		Attendant Position 3		Attendant Position 4	
	Default	Record	Default	Record	Default	Record	Default	Record
Station Pair	*1*		*2*		*3*		*4*	
Line Pair	*1,2*		*3,4*		*5,6*		*7,8*	
Line Group	*1*		*1*		*1*		*1*	
Serial Port	*1*		*2*		*3*		*4*	

9.4.2 Function Key Record *(Button Map)*

Function Key	Assigned Feature (Button Mnemonic)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Default = none assigned	



ACCT	account code button
ALTRN	alternate attendant button
ANSWER	answer button
APAGE	auxiliary page button
ARD	automatic redial button
ARECD	auxiliary record button
ARING	auxiliary ring button
AUTH	authorization code button
BOTH	both button
CAMP	camp on button
CID	caller ID button
DND	do not disturb button
DPKUP	directed call pick up button
DSTAT	DSS status button
EXOVR	executive override button
FEATR	feature button
FWD-A	forward all button
FWD-P	forward personal button
FWDRA	forward all RNA button
FWDRP	forward personal RNA button
GPLSN	group listen button)
GPKUP	group pick up button
HDST	headset button
HOLD	hold button
ITCM	intercom button
I####	intercom number button
LCDMS	LCD messaging button
LNG##	line group button 1–16
LN###	line button 1–128
LOCK	lock button
MMEPG	meet me page button
MSGWT	message waitng button
MUSC#	music source button 1, 2
NIGHT	night mode button
OAI##	open architecture button
OVERFL	overflow button
PAGE#	paging zone button 1–8
PARK#	park orbit button 1–9
PRVCY	privacy button
QUEUE	queue button
RLSE	release button
RSP##	response button 1–30
S-OBS	service observe button
SAVE	dynamic save button)
SDIAL	speed dial button
SILNT	silent ringer button
SOHVA	SOHVA button
SPLIT	split button
SRIAL	serial call button
SYSST	system status report button
TAFS#	night answer button 1–4, *= all calls
TBUSY	line test busy button
TRACK	tracker pager activate button
VABLK	voice announce block button
VOLSV	save volume button
XVM##	transfer to voice mail button 1–32

9.5 Voice Mail Records

9.5.1 Link Table

ExecuMail Port	Intercom Number	Linked Intercom Number
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
Default = No intercom numbers assigned or linked		

9.5.2 Integration Digits

Feature	Record	Default
Follow Extension ID		*2*
Intercom/Answer Confirmation		*1*
Busy		*2*
Do Not Disturb		*3*
Incoming Intercom Answer		*9*
Disconnect		*A*

9.6 Modem Setup

Feature	Default	Record
Data Port (1–18)	*2*	
Initialize String (Alphanumeric String)	*AT S0=1 M0 Q1 E0*	

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